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van Gilluwe

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(54) **ALTERNATE PROCEDURES ASSISTING COMPUTER USERS IN SOLVING PROBLEMS RELATED TO ERROR AND INFORMATIONAL MESSAGES**

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G06F 11/00 (2006.01)

(52) **U.S. Cl.**
USPC **714/38.1**; 714/48; 714/57

(58) **Field of Classification Search**
USPC 714/48, 57, 26, 38.1
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,740,357	A *	4/1998	Gardiner et al.	714/57
5,758,124	A *	5/1998	Ogata et al.	703/27
5,892,898	A *	4/1999	Fujii et al.	714/57
5,944,839	A *	8/1999	Isenberg	714/26
6,012,152	A *	1/2000	Douik et al.	714/26
6,029,258	A *	2/2000	Ahmad	714/46
6,334,193	B1 *	12/2001	Buzsaki	714/2
6,529,954	B1 *	3/2003	Cookmeyer et al.	709/224
6,742,141	B1 *	5/2004	Miller	714/26
7,007,200	B2 *	2/2006	Salem	714/26
7,016,954	B2 *	3/2006	McKenzie et al.	709/224
7,191,364	B2 *	3/2007	Hudson et al.	714/38.11
7,293,201	B2 *	11/2007	Ansari	714/38.14
7,360,125	B2 *	4/2008	Krebs	714/48
7,475,286	B2 *	1/2009	Altaf et al.	714/27
7,757,126	B2 *	7/2010	Vidiyala	714/38.14
2003/0028825	A1 *	2/2003	Hines	714/37
2004/0024840	A1 *	2/2004	Levine et al.	709/217
2007/0127455	A1 *	6/2007	Fujioka	370/356
2007/0277061	A1 *	11/2007	Ashe	714/57

* cited by examiner

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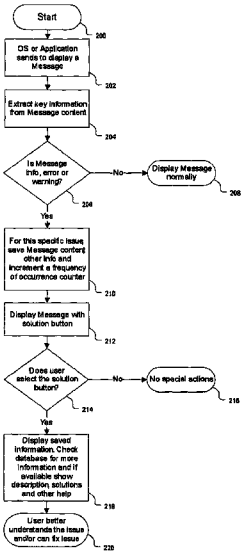
(57) **ABSTRACT**

The invention monitors display (error) messages from software programs presented to users and looks for items of interest. When detected, the text of the message is collected along with source of the message, and other details. This data is checked against a database of Messages, either locally, or networked to a remote database. If the issue has not been previously detected it is added to the database. If the message had been detected previously, counters recording frequency of occurrence. Then an option to see additional information is provided. If selected the database returns all the information it has on this specific issue. Also, additionally created content that normally does not exist in the message such as which application and vendor issued the message, frequency of occurrence, and vendor contact information. Additional content such as a detailed description and solutions that were manually created is included in the results to the user. The user can perform additional research and the collected information can be emailed to another user or company.

4 Claims, 14 Drawing Sheets



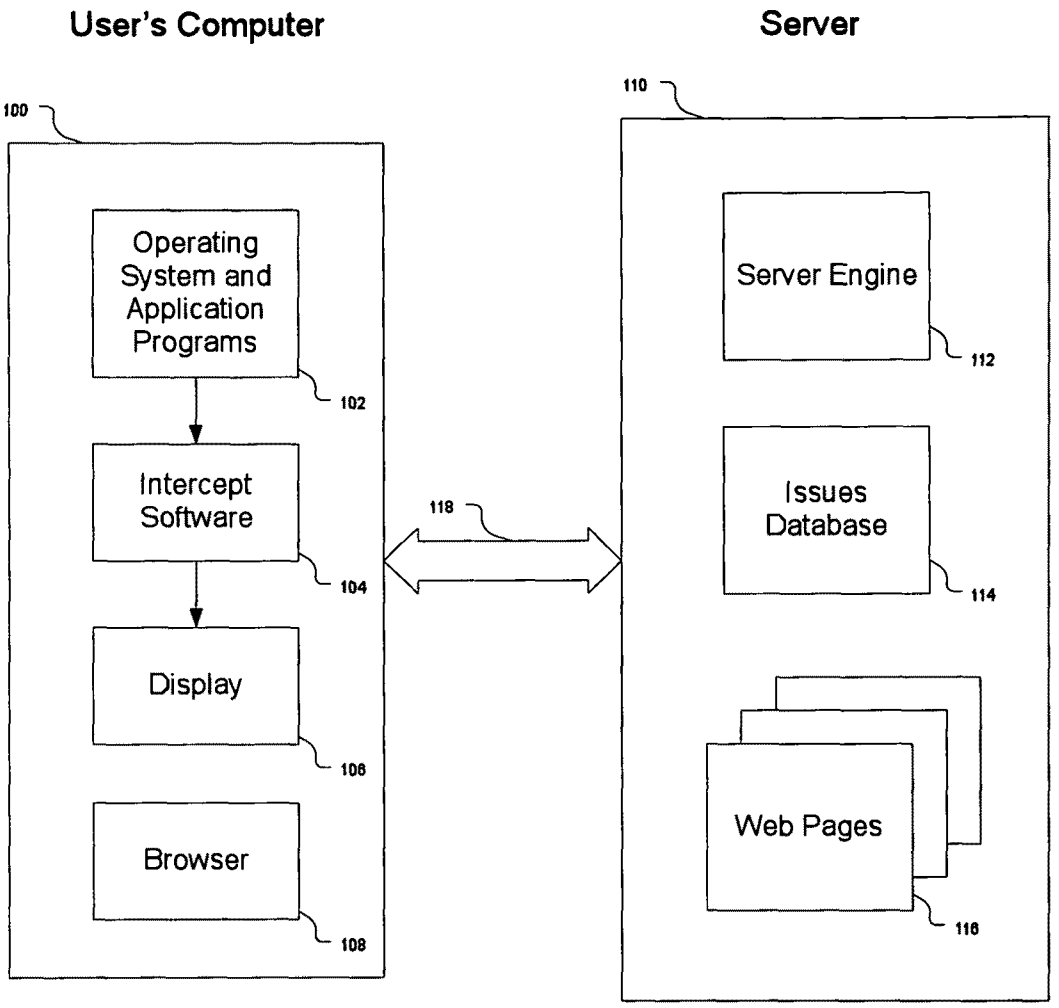

User's Computer
Server
100
110
Operating System and Application Programs
102
Intercept Software
104
Display
106
Browser
108
118
Server Engine
112
Issues Database
114
Web Pages
116

Figure 1

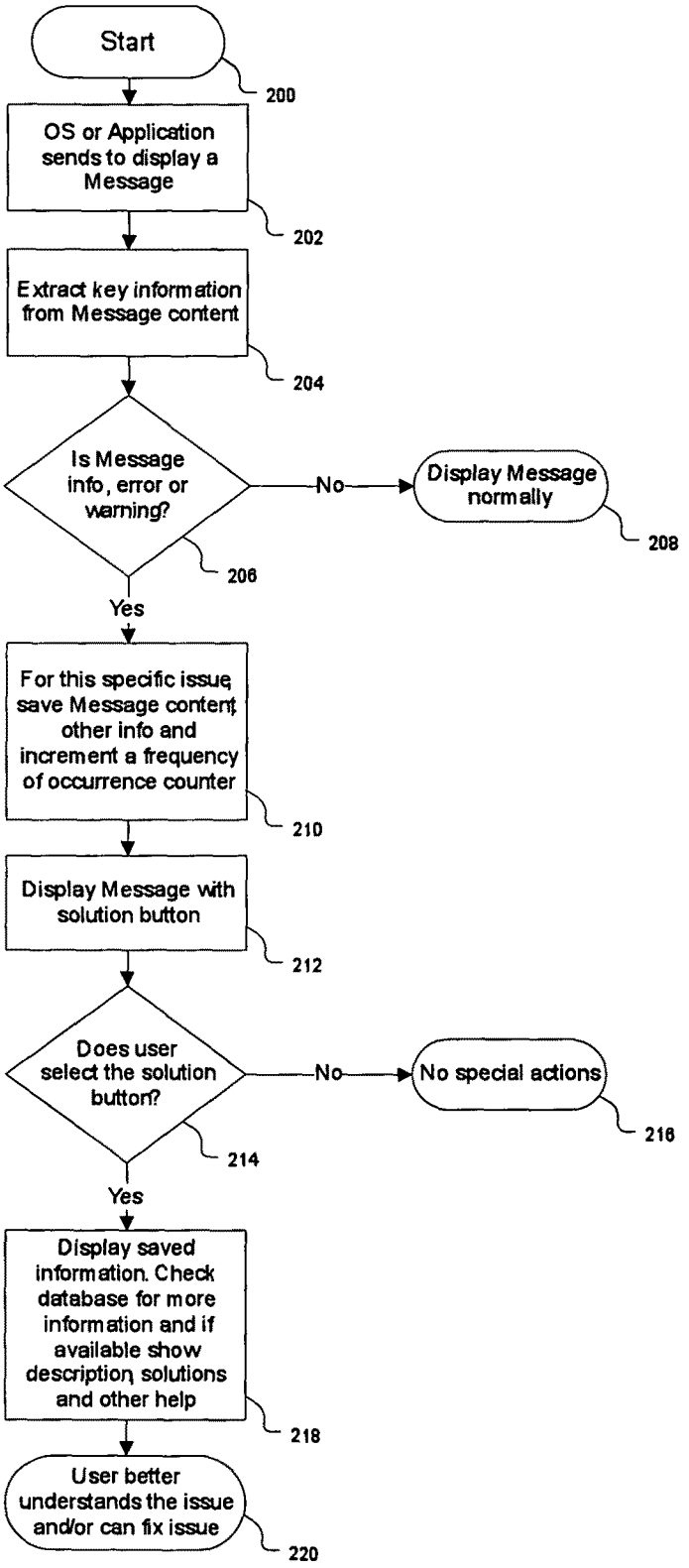

Start
200
OS or Application sends to display a Message
202
Extract key information from Message content
204
Is Message info, error or warning?
No
Display Message normally
208
206
Yes
For this specific issue, save Message content, other info and increment a frequency of occurrence counter
210
Display Message with solution button
212
Does user select the solution button?
No
No special actions
216
214
Yes
Display saved information. Check database for more information and if available show description, solutions and other help
218
User better understands the issue and/or can fix issue
220

Figure 2

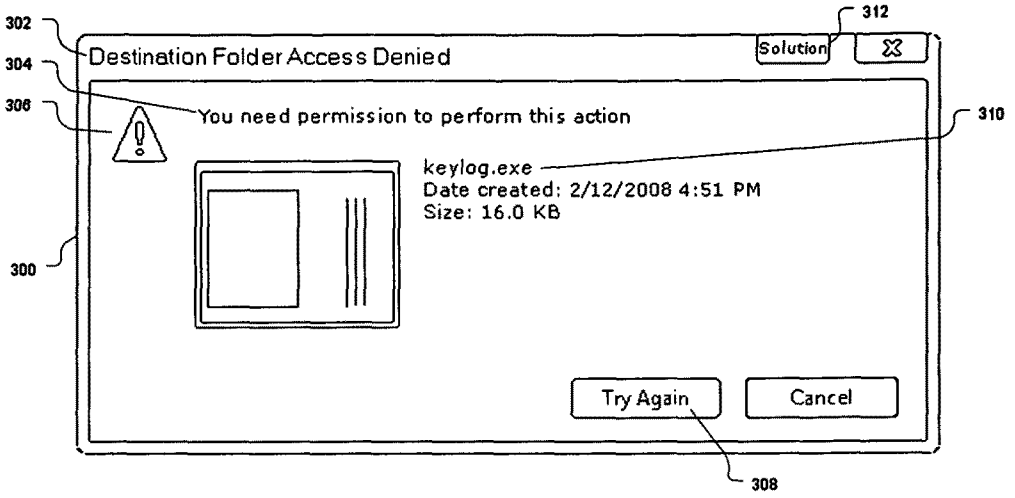

302
304
306
300
312
310
308
Destination Folder Access Denied
Solution
You need permission to perform this action
keylog.exe
Date created: 2/12/2008 4:51 PM
Size: 16.0 KB
Try Again
Cancel

Figure 3

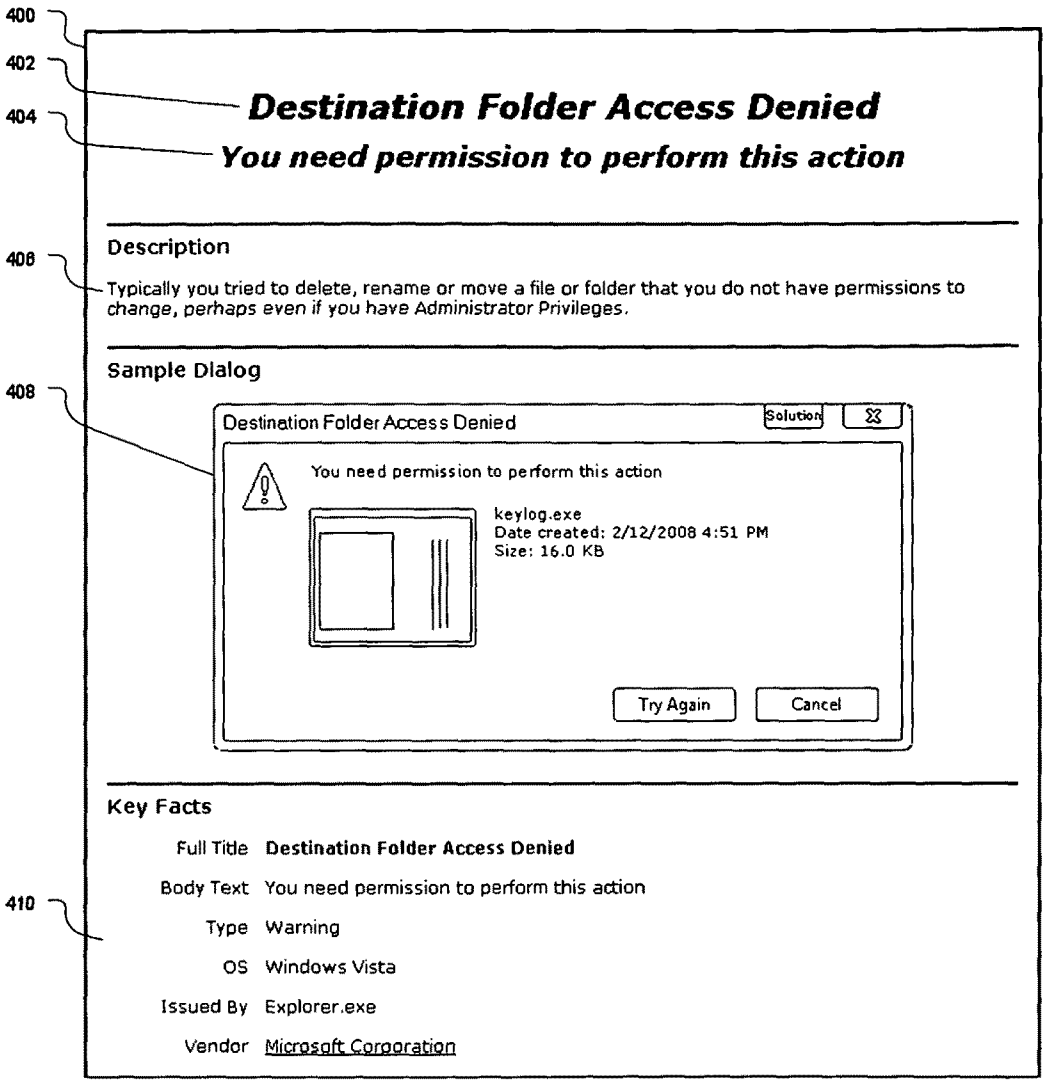

400
402
404
406
408
410
Destination Folder Access Denied
You need permission to perform this action
Description
Typically you tried to delete, rename or move a file or folder that you do not have permissions to change, perhaps even if you have Administrator Privileges.
Sample Dialog
Destination Folder Access Denied
Solution
You need permission to perform this action
keylog.exe
Date created: 2/12/2008 4:51 PM
Size: 16.0 KB
Try Again
Cancel
Key Facts
Full Title Destination Folder Access Denied
Body Text You need permission to perform this action
Type Warning
OS Windows Vista
Issued By Explorer.exe
Vendor Microsoft Corporation

Figure 4a

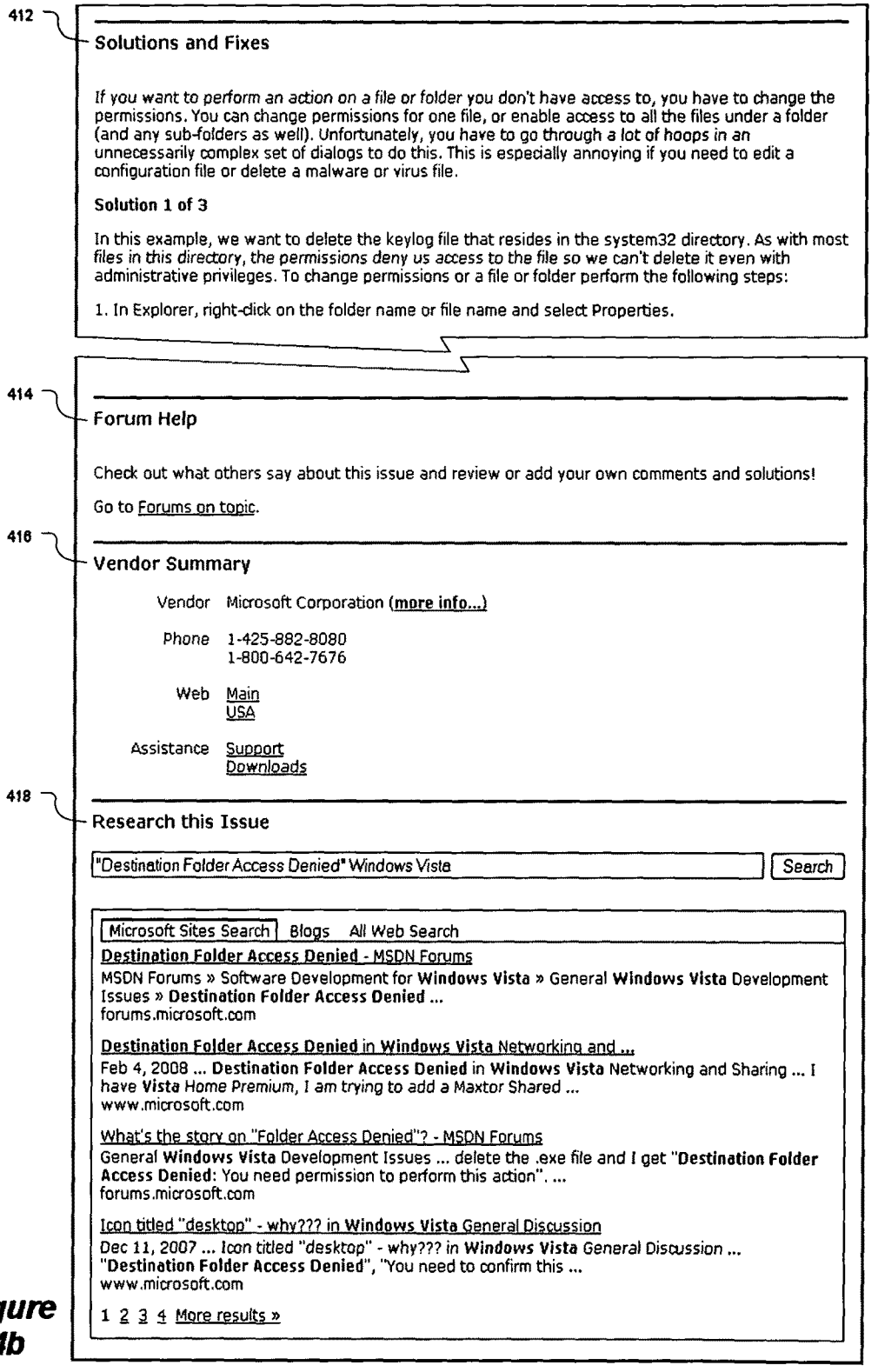

412
Solutions and Fixes
If you want to perform an action on a file or folder you don't have access to, you have to change the permissions. You can change permissions for one file, or enable access to all the files under a folder (and any sub-folders as well). Unfortunately, you have to go through a lot of hoops in an unnecessarily complex set of dialogs to do this. This is especially annoying if you need to edit a configuration file or delete a malware or virus file.
Solution 1 of 3
In this example, we want to delete the keylog file that resides in the system32 directory. As with most files in this directory, the permissions deny us access to the file so we can't delete it even with administrative privileges. To change permissions or a file or folder perform the following steps:
1. In Explorer, right-click on the folder name or file name and select Properties.
414
Forum Help
Check out what others say about this issue and review or add your own comments and solutions!
Go to Forums on topic.
416
Vendor Summary
Vendor Microsoft Corporation (more info...)
Phone 1-425-882-8080
1-800-642-7676
Web Main
USA
Assistance Support
Downloads
418
Research this Issue
"Destination Folder Access Denied" Windows Vista
Search
Microsoft Sites Search
Blogs
All Web Search
Destination Folder Access Denied - MSDN Forums
MSDN Forums » Software Development for Windows Vista » General Windows Vista Development Issues » Destination Folder Access Denied ...
forums.microsoft.com
Destination Folder Access Denied in Windows Vista Networking and ...
Feb 4, 2008 ... Destination Folder Access Denied in Windows Vista Networking and Sharing ... I have Vista Home Premium, I am trying to add a Maxtor Shared ...
www.microsoft.com
What's the story on "Folder Access Denied"? - MSDN Forums
General Windows Vista Development Issues ... delete the .exe file and I get "Destination Folder Access Denied: You need permission to perform this action". ...
forums.microsoft.com
Icon titled "desktop" - why??? in Windows Vista General Discussion
Dec 11, 2007 ... Icon titled "desktop" - why??? in Windows Vista General Discussion ... "Destination Folder Access Denied", "You need to confirm this ...
www.microsoft.com
1 2 3 4 More results »

Figure 4b

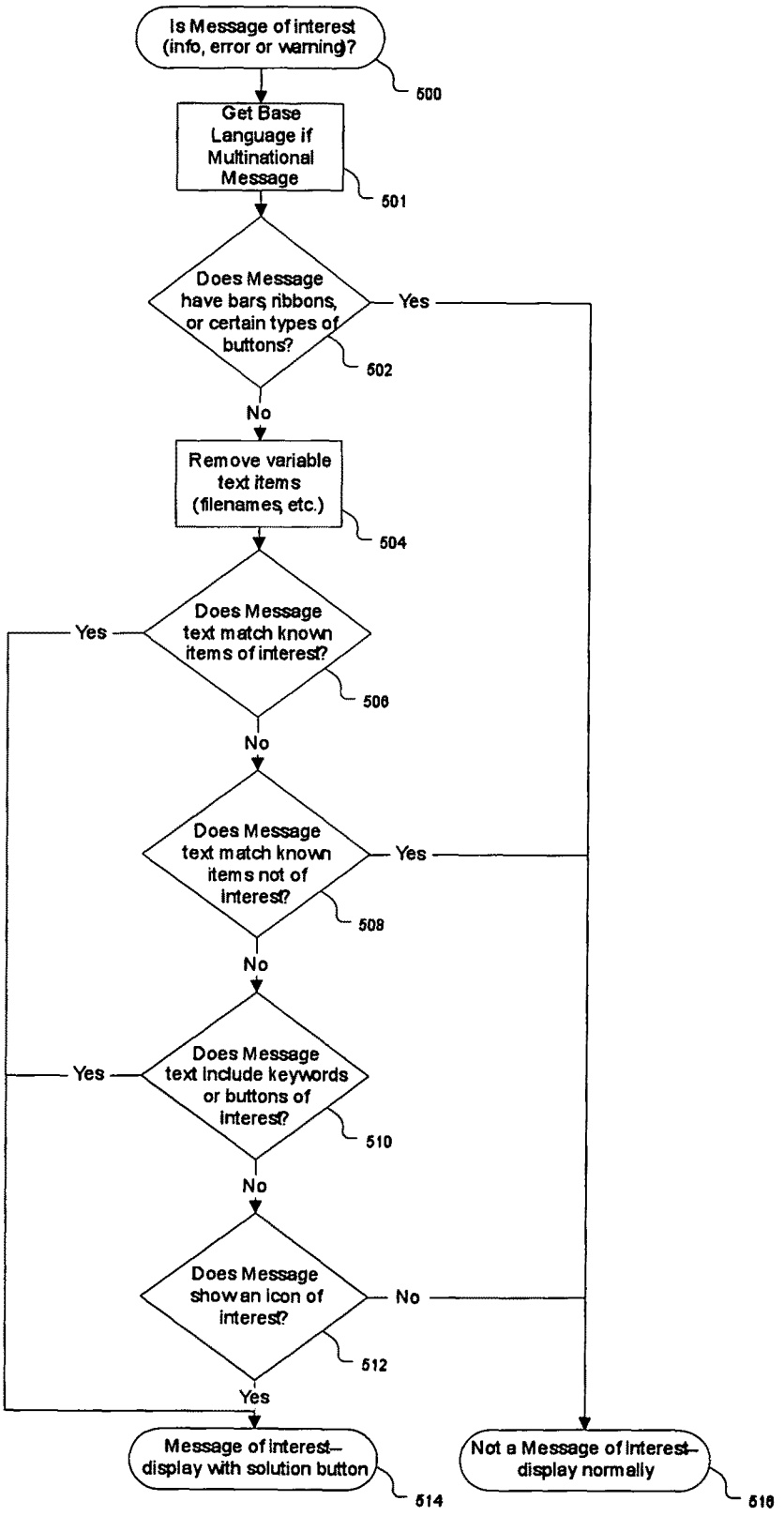

Is Message of interest (info, error or warning)?
500
Get Base Language if Multinational Message
501
Does Message have bars, ribbons, or certain types of buttons?
Yes
502
No
Remove variable text items (filenames, etc.)
504
Does Message text match known items of interest?
Yes
506
No
Does Message text match known items not of interest?
Yes
508
No
Does Message text include keywords or buttons of interest?
Yes
510
No
Does Message show an icon of interest?
No
512
Yes
Message of interest– display with solution button
514
Not a Message of interest– display normally
516

Figure 5

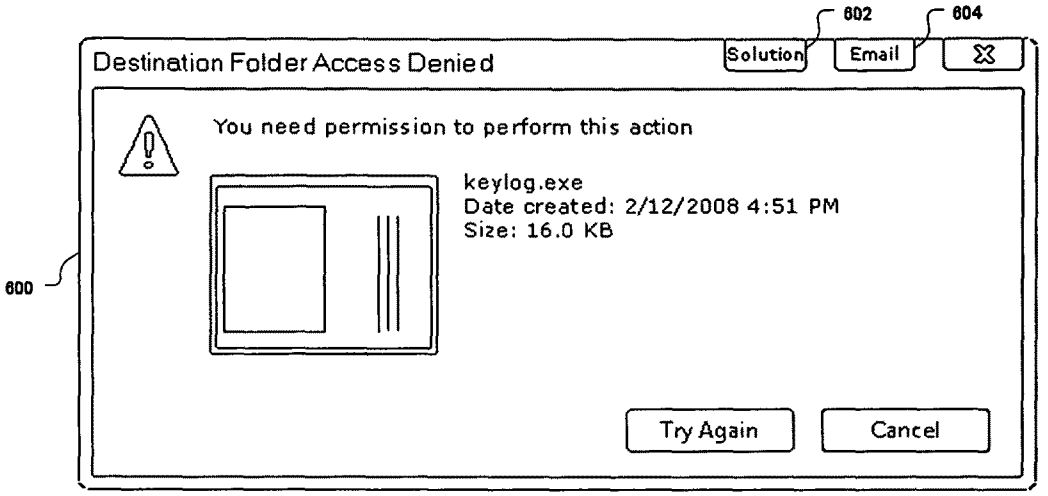

602
604
Destination Folder Access Denied
Solution
Email
You need permission to perform this action
keylog.exe
Date created: 2/12/2008 4:51 PM
Size: 16.0 KB
600
Try Again
Cancel

Figure 6

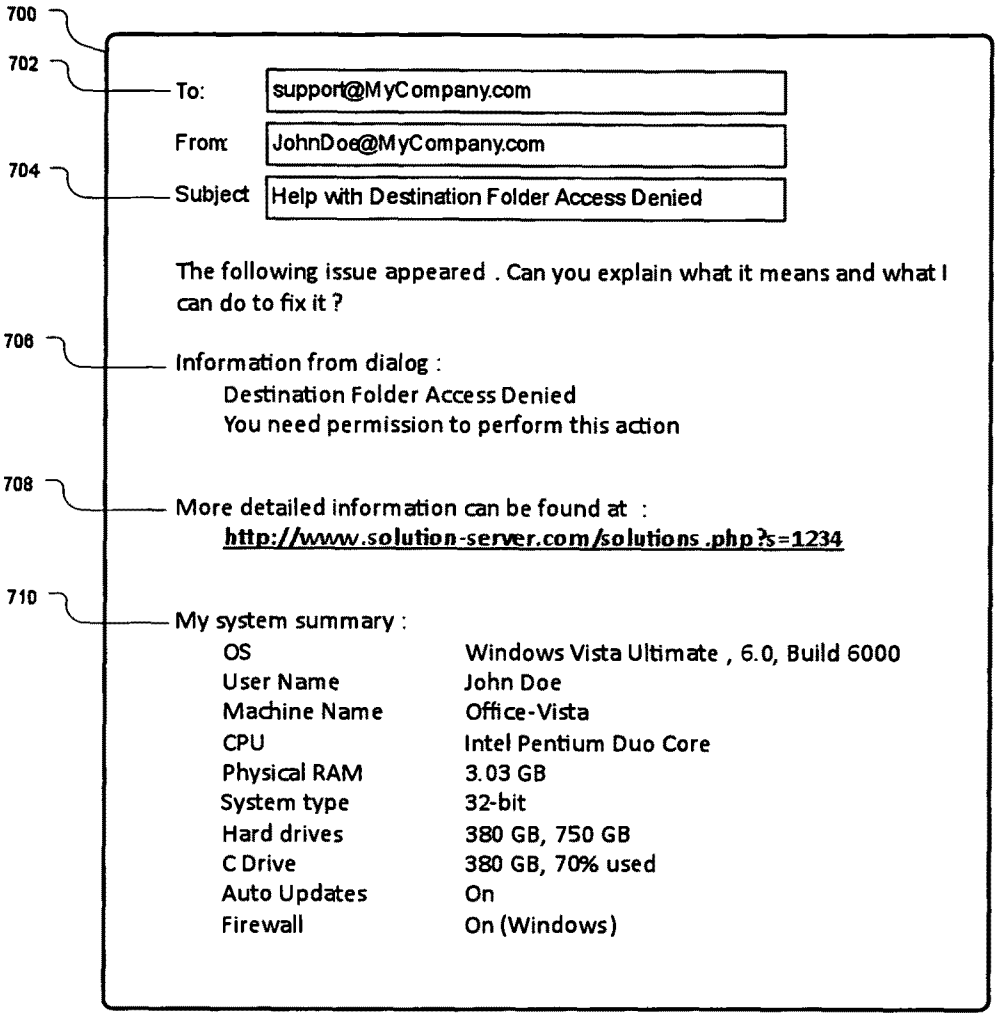

700
702
To: support@MyCompany.com
From: JohnDoe@MyCompany.com
704
Subject Help with Destination Folder Access Denied
The following issue appeared . Can you explain what it means and what I can do to fix it ?
706
Information from dialog :
Destination Folder Access Denied
You need permission to perform this action
708
More detailed information can be found at :
http://www.solution-server.com/solutions .php?s=1234
710
My system summary :
OS Windows Vista Ultimate , 6.0, Build 6000
User Name John Doe
Machine Name Office-Vista
CPU Intel Pentium Duo Core
Physical RAM 3.03 GB
System type 32-bit
Hard drives 380 GB, 750 GB
C Drive 380 GB, 70% used
Auto Updates On
Firewall On (Windows)

Figure 7

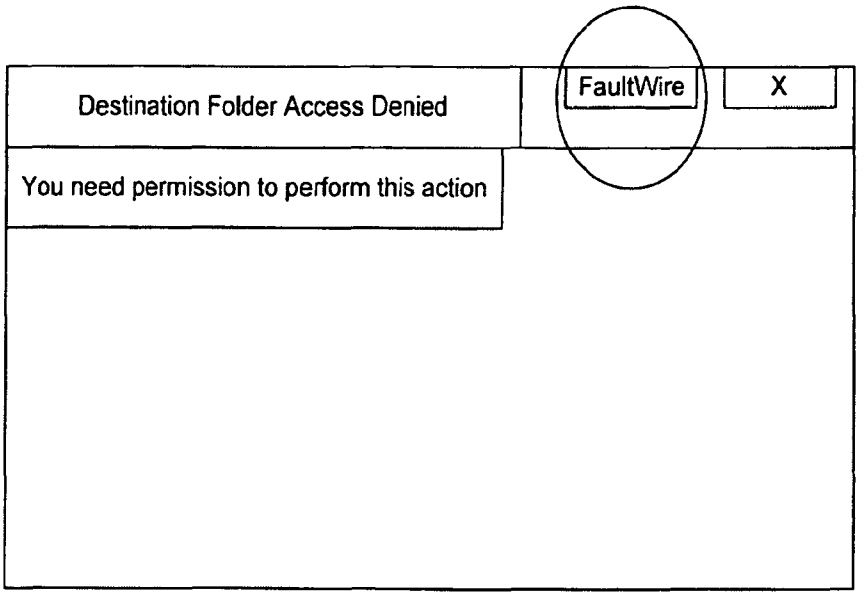

Destination Folder Access Denied
FaultWire
X
You need permission to perform this action

FIG. 8A

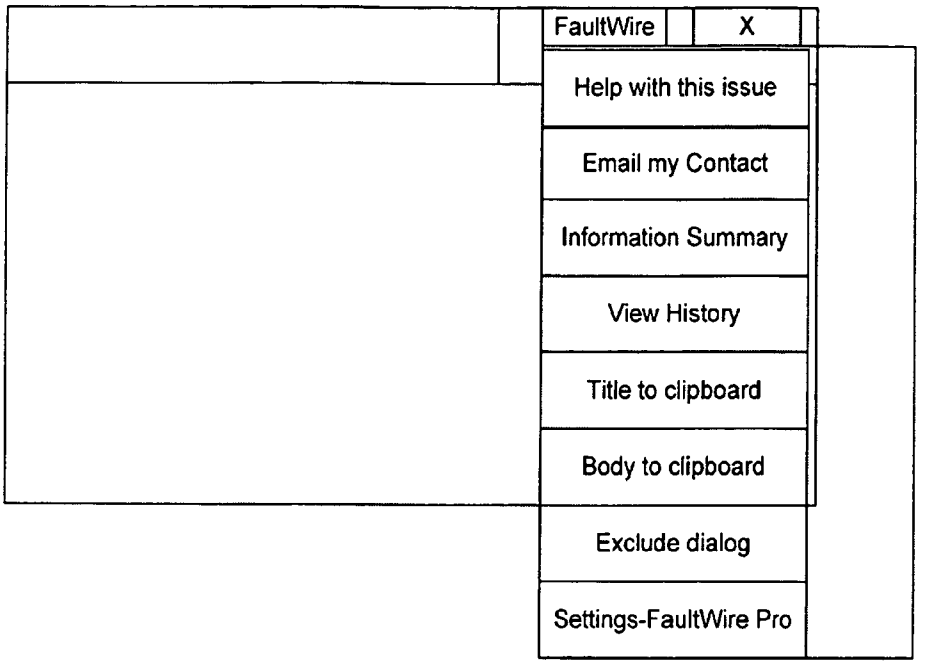

FaultWire
X
Help with this issue
Email my Contact
Information Summary
View History
Title to clipboard
Body to clipboard
Exclude dialog
Settings-FaultWire Pro

FIG. 8B-1

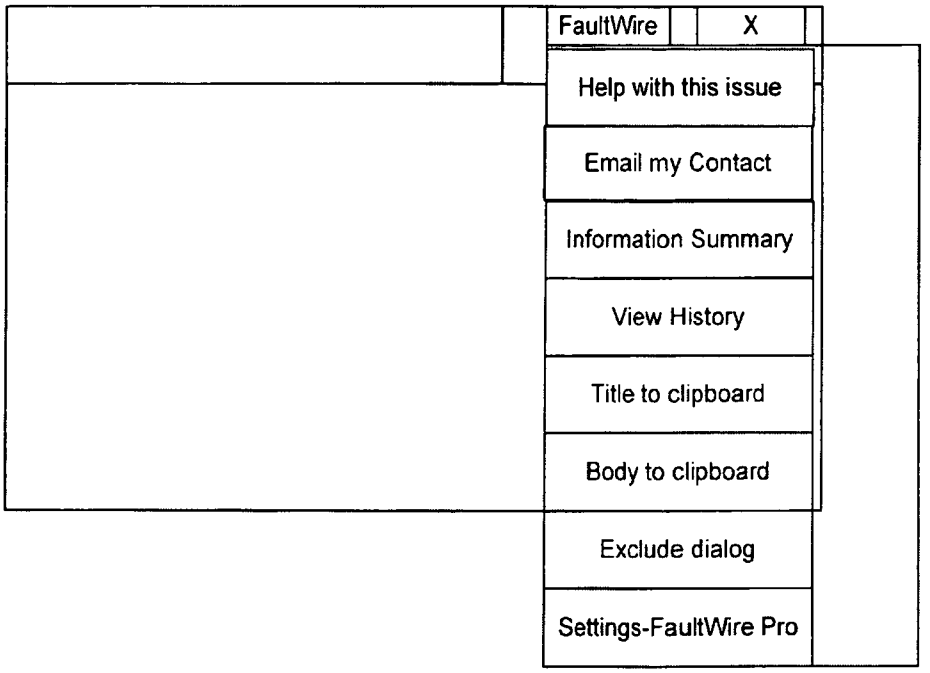

FaultWire
X
Help with this issue
Email my Contact
Information Summary
View History
Title to clipboard
Body to clipboard
Exclude dialog
Settings-FaultWire Pro

FIG. 8B-2

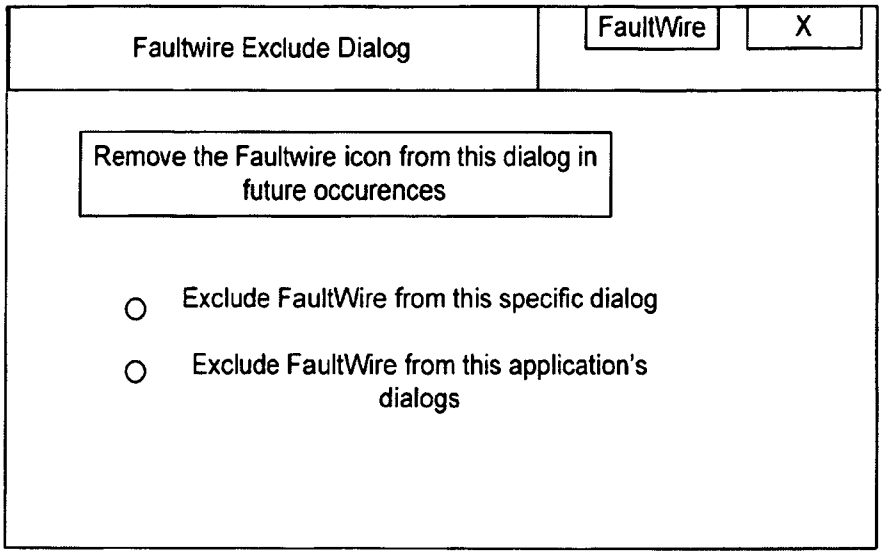

Faultwire Exclude Dialog
FaultWire
X
Remove the Faultwire icon from this dialog in future occurences
Exclude FaultWire from this specific dialog
Exclude FaultWire from this application's dialogs

FIG. 8C

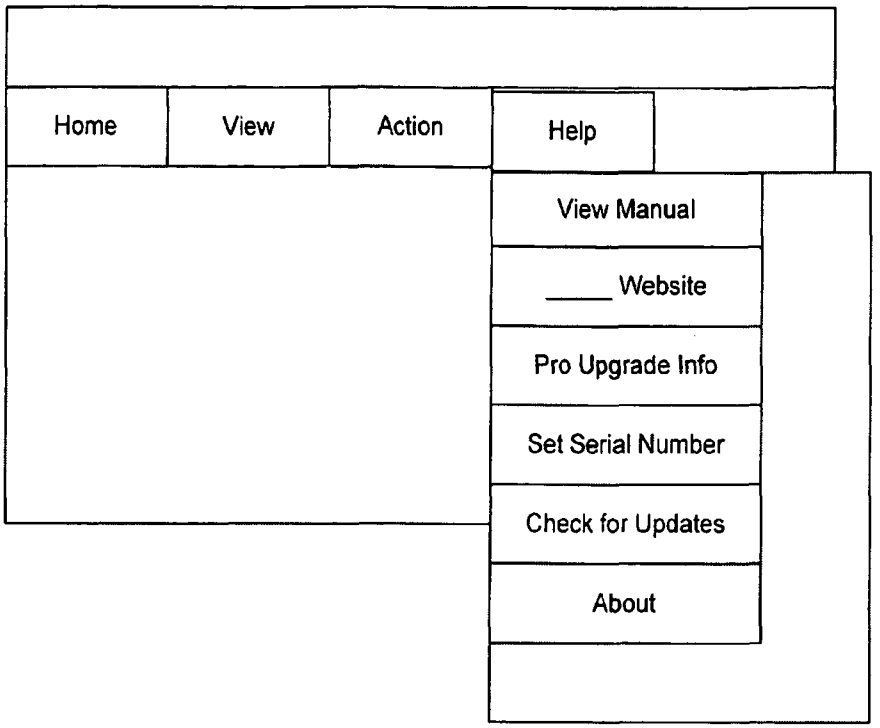
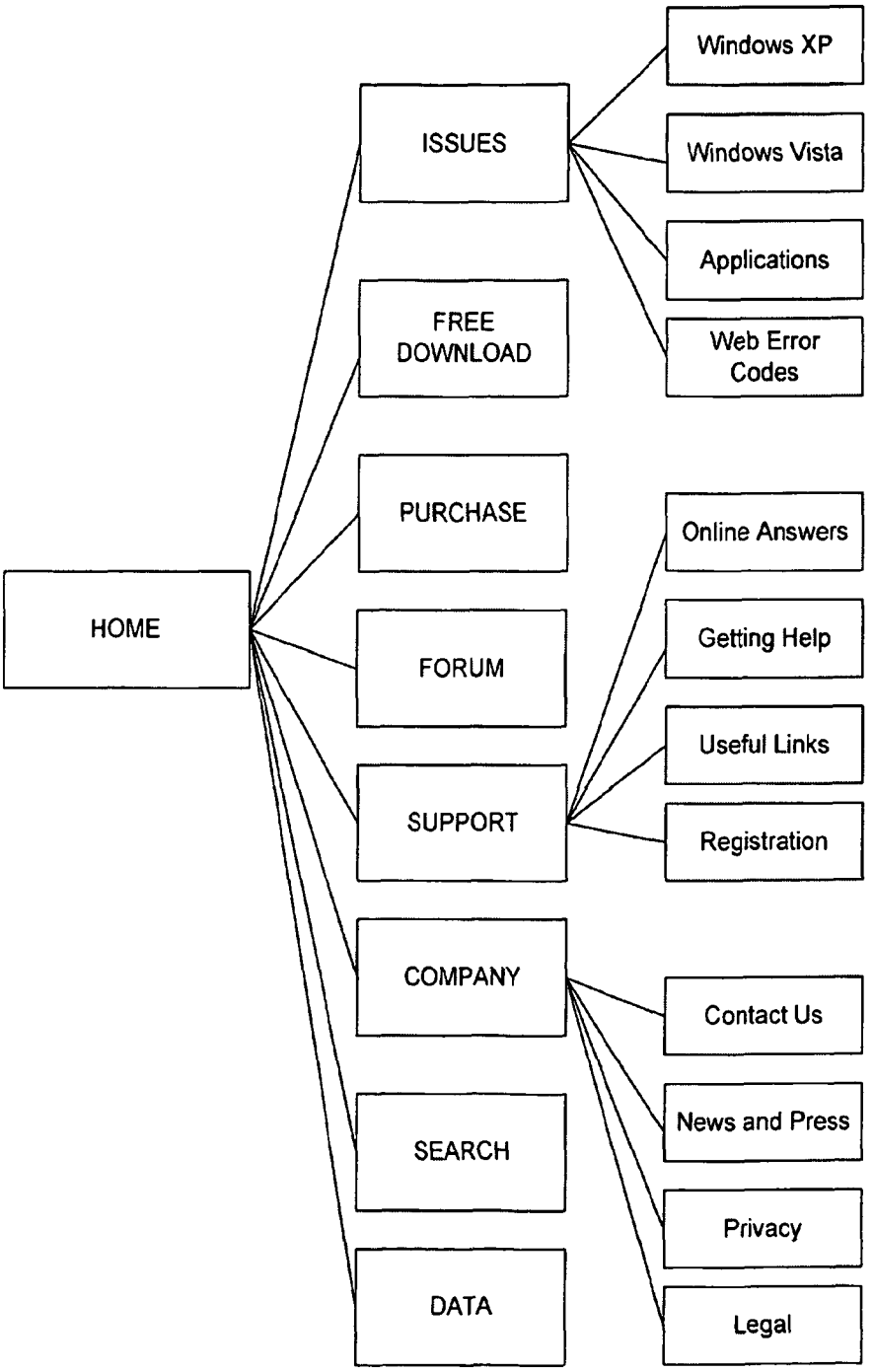

Home
View
Action
Help
View Manual
_____ Website
Pro Upgrade Info
Set Serial Number
Check for Updates
About

FIG. 8D

FIG. 9


HOME
ISSUES
FREE DOWNLOAD
PURCHASE
FORUM
SUPPORT
COMPANY
SEARCH
DATA
Windows XP
Windows Vista
Applications
Web Error Codes
Online Answers
Getting Help
Useful Links
Registration
Contact Us
News and Press
Privacy
Legal

ALTERNATE PROCEDURES ASSISTING COMPUTER USERS IN SOLVING PROBLEMS RELATED TO ERROR AND INFORMATIONAL MESSAGES

REFERENCE TO PRIORITY DOCUMENTS

This Application claims priority under 35 USC 119(e) to Provisional Application Ser. No. 61/084,590, entitled Method and System for Assisting Computer Users in Understanding Messages and Solving Problems, filed in the USPTO on Jul. 29, 2008, which is incorporated by reference in its entirety for all purposes.

BACKGROUND OF THE INVENTION

U.S. Pat. No. 7,191,364 (2007) shows a method for creating dumps of data from a crash or hang and sending such data to a server for possible solutions. However, it clearly does not deal with important system crashes or hangs where the system is often non-functional or unstable, but covers situations where the operating system or running applications issue an informational, warning or problem type message.

U.S. Pat. No. 7,149,928 2006) shows a means to monitor an application program for a fault or crash and send such information to a server. However, has no means to provide any information to the user that originated the problem or assist the user in any way.

U.S. Pat. No. 7,028,056 (2006) shows a method to collect information locally following a critical software failure. While my invention does collect data, it is not related to software failures that prevent the system from continuing to operate, but covers situations where the operating system or running applications issue an informational, warning or problem type message and the operating system continues to run.

U.S. Pat. No. 6,874,125 (2005) shows a method to attach a feedback button to every dialog, message, and top-level windows dialogs.

Microsoft (software/OS) provides an example of a hand coded error dialog from Windows (shown in FIG. X). This shows a way to check for a solution for one error, but it requires a programmer to create the special dialog for each specific error, and it does not ensure there is any solution or additional information.

Avanquest PowerDesk Professional User Manual, v7, 2008—Page 161-165 (first published in 1998). Dialog Helper has a means to attach a function button to Save and Save-as dialogs, but no others.

SUMMARY OF THE INVENTION

The present invention provides a need, unrepresented in the prior art discussed above, by assisting the user in an effective and efficient search for a potential solution to a software message (usually an error message). A summary of benefits to the user of this invention includes:

- Helps user to understand what a message means, which program generated the message, the publisher of the program and other helpful details.
- See the frequency of occurrence as compared with other users.
- Access specific help on a message with a single-click or button selection.
- Makes it easy to research the message using the dialog text without having to hand type in the text of the message.
- Provides a means to include a detailed description and solutions to the user.

- Provides information about the publisher and how to get support from the publisher.
- Requires no modifications to the publisher's Programs.
- Ability to send the message contents and additional details to another person who can assist with the issue.

The present invention always provides solution information, in contrast to the '364 which cannot provide any information unless someone has manually created such information after the collection of data. The present invention differs from the '928 patent and improves upon it, in that it helps a user by providing information about the issue and covers informational, warning and problem type messages from all sources, including the operating system and application programs. The present invention improves on the Microsoft system as it requires no coding by the application program or operating system to create a message that has a solution option. In addition, the invention always provides solution information. The invention, improves over '125 patent in that it selectively attaches a solutions button to specific types of dialogs, for an entirely different purpose than the '125 patent.

Many messages produced by an operating system and other software applications are confusing to the user, cryptic or misleading typically offering the option "OK" without help to solve the issues at hand. For example, the Windows® operating system(s) does not allow users to capture the message to help search out an answer. To use a search engine such as Google, users have to retype the message in and wade through many useless forums, ads, and products hoping to find some clue as to what it means and how can the issue be fixed.

The present invention provides the first means to get the answers users need with a minimum of effort. When an error or warning message appears, a specialized icon appears in the title bar.

In the operation of a main embodiment of the invention, the client program module of the primary embodiment of the invention intercepts all Windows dialogs and looks for items to identify warnings and errors of interest. This includes the message type, icons used, and text within the message. There will also be an exclusion list to skip messages that are not of interest, but would be incorrectly triggered. The error contents and source will also generate a unique token to identify this message.

The client program module also has a settings page that offers some minor options and control for a user. One of the options which may be enabled by default (with proper user disclosure) is to send all error information to the networked data accumulation server (NDAS) in an anonymous fashion, even if the user doesn't click on the activation icon in an error message. This is a preferred embodiment of the invention which can quickly create and build the database of error content located in the networked data accumulation server. It also allows the data accumulation process, included in many embodiments of the invention (whether manual or automatic) to identify the most frequent issues and put more attention on these particular problems and to allocate network and data resources appropriately.

The SQL server component of particular embodiments of the invention collects the error information and is used to create database generated web content. Since the database will become large(r) over time, it needs to be scalable and fast, but these are mostly phase 2 concerns. The server also hosts a Vendor database with generic information about the Vendor, Vendors website, Support from that vendor, logo, and other details.

A management facility will allow the content manager components to add additional information and help optimize

the results. They can also include screen shots and blur out areas that change for each user. They can also "connect" up like errors or reference other errors as appropriate. Content managers will also link to a vendor's FAQ section that talks about the specific issue.

The web site component of the invention displays the content from the database. The site will also contain a number of category index pages with links to each content page. This is necessary for the search engine robots to locate and index all the content pages. The generated content can include a screen-shot of the specific error or a fake message that includes the title, content, buttons and icon of the error message. It will be automatically created in a number of styles to match the most common skins and Os(es) supported. For example, if the user has XP, with chrome style, the generated error message will use the same style.

Lastly, the web site component includes a targeted forum section at the bottom of each content page. Users can also access the forum from the home page, but normal access is through the content page. Users can read posts from other users, reply to those posts, or create new posts. We may also moderate some of these forums or allow companies who own the related product to be a moderator for issues with that product.

The forum system provides the ability to automatically email users (at their choice) when a selected forum changes. The invention also offers the ability to send private messages between forum users.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring now to the figures included in the application:

FIG. **1** is a Block diagram of the components of the User's computer and separate server.

FIG. **2**—A flowchart of the overall operation of a first embodiment of the invention.

FIG. **3**—An example warning dialog showing the components and solution button.

FIG. **4***a*—illustrates a first sample display screen encountered by a user when the solution button is selected;

FIG. **4***b* illustrates a second sample display screen encountered by a user when the solution button is selected;

FIG. **5** illustrates a flowchart of the process to determine if a dialog is one of interest, such as a warning, problem or informational dialog.

FIG. **6**—An example Message with an Email button.

FIG. **7**—An example automatically generated Email.

FIG. **8**A is the sample of the display notice including the solution button;

FIG. **8**B-**1** is na example of a menu displayed when a user activates the solution button;

FIG. **8**B-**2** is another example of the menu displayed when a user activates the solution button.

FIG. **8**C is an example of a exclusion dialog screen; and FIG. **8**D is an additional menu; and

FIG. **9** is a site map as used in a primary embodiment of the invention.

DETAILED DESCRIPTION OF THE OPERATION

While the examples given below generally are shown for Windows® operating systems the invention may to any OS. In general, a specific series of embodiments of invention are given as examples, and discussed under the trade name FaultWire®, although Faultwire® includes many of the embodiments of the invention, the invention is not limited to those embodiments as they are for illustrative purposes only.

Now referring to FIG. **1**, a user's computer **100** contains an operating system and application programs **102**, along with the invention's intercept software **104**, a display **106** and a communications path **118** between the user's computer and the server **110**. The server **110** has a server engine **112** that saves Message information from the intercept software **104** over the communications path **118**. The database **114** is used to store new Message information if the information has not been previously recorded as well as recording frequency of occurrence of each Message. Should the software **104** request a solution page for the Message, the Server Engine **112** will build a web page **116** containing the information from the database for this specific issue and the web page **116** is passed via the communications link to the computer's browser **108**. This method has the advantage of helping multiple users. In addition, having multiple users contribute to the database will expand the collection of information that is available to all the users.

FIG. **2** shows the process staring at step **200**. An operating system or application program **202** sends to the display a Message. Before the Message appears, the invention intercepts the process **203** and extracts key information from the Message and the Message sender in **204**. This can include all the text within the message, special graphics such as a warning or problem icon, and the identification of which application or operating system component sent the message.

A determination is made if this Message is a warning, problem or informational type Message at **206**, which is explained in more detail later. If the Message is not one of interest, then at **208**, the Message displays normally and no further actions are taken. If the Message is of interest, at **210**, the information is saved in database **114** on the server **110** if this data has not been saved before. In all cases, a frequency of occurrence counter for this specific Message is incremented in database **114** on the server **110**. In **212**, the Message is displayed and a solution button is made available.

When any system or application dialog opens, the invention executes an investigation module that checks to see if it appears to be an error or warning message of interest. For those dialogs of interest, the invention, through the execution of an insertion module, inserts a solution icon in the title bar as shown in FIG. A**1**. This icon is used to get additional information about the error, either locally, or by accessing the FaultWire website (a sample map of the site is shown in FIG. B**1**, as would be used in a particular embodiment of the invention), with a page specific to the issue at hand. In general, the specialized solution button appears to the left of any other buttons that appear in the title bar. The user can click on the icon to go to our specific web page with details about the error and possible solutions.

Embodiments of the invention use automatic means to find out if the icon should appear or not. An executable module then scans the dialog manager list to see if it should override the automatic state and either include or exclude the item. This process is discussed in more detail below.

When FW loads it issues a command to hook messages. For example, Windows provides an API call SetWindowsHookEx, that along with the first parameter "WH_GETMESSAGE" tells Windows to installs our hook procedure that monitors messages posted to a message queue. The specific line of code (in this particular example) is: [g_hhookSend=SetWindowsHookEx(WH_GETMESSAGE, GetPostMsgProc, g_hinstDll, dwThreadId);] The GetPostMsgProc is the "hook" that gets called when a message appears on the display along with details about the message. As a sample more detail on the Window API function is included as Appendix A. It should be noted that the

specific line of code is used for illustrative purposes only and will vary in different embodiments.

One way the Message may appear is shown in the example in FIG. **3-300**. A Message such as this may contain a number of elements, but these elements may or may not appear depending on the Message. Typical elements include a title **302**, the body **304**, an icon **306**, and additional text or graphics **310**. Messages of interest normally have one or more buttons **308**. This Message example shows one way the solution button **312** could be added to the Message by the invention, although the solution button could be elsewhere within or outside the Message, or a hot-key (a combination of one or more keyboard keys) could be used.

Continuing the process in FIG. **2**, at **214**, the user may not select the solution button, in which case, **216**, no special action occurs. If the user should select the solution button, the information collected in **204** is now displayed to the user in **218**. Any additional previously saved information about this issue is also displayed such as a detailed description and solutions. This information helps the user understand and/or solve the issue.

One way this information is conveyed to the user is shown in FIG. **4***a*-**400**. The Message title appears at **402**, and is followed by the Message body text in **404**. In **406** an optional description of the issue appears. A screen shot of the Message appears in **408** that is a similar or exact image of the specific issue Message. Key facts appear in **410**.

FIGS. **4***a* and **4***b* is a preliminary view of the web page content the user sees when they click on the FaultWire (solution tab/button) icon in the error "Destination Folder Access Denied". Not shown is the navigation, header, footer and advertising information.

The web page is specific to the error message and explains the issue and provides a solution. In some cases, it may be that FaultWire does not have detailed information. In these cases, information is provided as to which application generated the message and the search section can help users quickly locate more information with a minimum of additional work.

The search box already includes key words from the error message and is targeted for the OS (or vendor, if not an OS related issue). Multiple tabs are also included to tightly focus the search. The first tab is specific to the error message's vendor. The second tab searches the web, but excludes known sites that are a waste of time or that require any kind of logon.

Continuing to FIG. **4***b*-**412**, an optional solution for the issue appears. In **412** a link is provided to a forum where users add comments and view what others have said about this specific issue. At **416** a summary of vendor information appears. Lastly, at **418** the error Message text is submitted to a search engine to view additional links about this issue that appear on the Internet. The user can easily copy the text from different areas of **400** to communicate the issue with other people without having to type the text again.

FIG. **5** illustrates a **500** explains the process of determining if the Message is of interest or not by expanding the decision shown in FIG. **2**-**206**. First, some operating systems and programs offer a base language (for example English) for a multi-national message support. In **501**, if such a base message text is available, it is used in place of the actual message text to simplify later tests. An alternative approach would eliminate this step and handle each message in it's original language and use text comparisons that match the language used. For the balance of this section, we'll assume the message is in English.

In **502**, if the Message contains a menu-bar, ribbons, scroll bars, a status bar or specific button text such as "Finish", "Finished", "Done", "Next" or "Back", it is not a Message of interest and the Message is displayed normally at **516**. Otherwise at **504** we examine the text that appears in the Message such as **302**, **304** and **310**, and remove any pathnames, filenames, dates, times, sizes, and other information that will change with each occurrence of the specific Message. The resultant text is examined in **506** to see if the Message text or a portion of the text matches a list of known issues. If so, this is a Message of interest **514**.

If in **506**, no match is made, a check **508** is made to see if the resultant text or a portion of the text from **504** matches a list of known non-issues. If a match is made, then this is not a Message of interest **516**.

If in **508** no match is made **510** checks to see if the resultant text from **504** has a keyword that indicates it is a Message of interest. If using English, keywords may include words like "Error", "Errors", "Warning", "Fatal", "Failed", "Problem", "Problems", "Denied", "unexpected", "confirm", "incompatible", "unable", "cannot", "can't" or "could not". Text in all buttons is also examined for keywords such as "Try Again", "Abort", "Retry", "Ignore", "Check online" or "Hide details". If these keywords appear, then the Message is considered a Message of interest **514**.

If no keywords of interest are found in **510**, then **512** checks to see if the Message uses a common icon that signifies a Message of interest. Some of the icons could include those signifying a warning, problem, forbidden, information, or help. If such an icon is not detected, then it is not a Message of interest **516**. Otherwise it is a Message of interest **514**.

TABLE A

Issue Table of Interest

Type	Title	Body	Filename	Comment
Include	Red Alert	The data will not be read due to*	Excel*	This is always a problem we want to trap.

If in **506**, no match is made, a check **508** is made to see if the resultant text or a portion of the text from **504** matches a list of known non-issues. If a match is made, then this is not a Message of interest **516**.

Non-issues are identified as Exclude type and otherwise similar to the prior include entries. It contains match strings for the title, body and application name. These strings can have a wildcard character "*" to signify anything after the asterisk is unimportant. These string comparisons should also be made case-insensitive. The comment field can be ignored and is just to explain what the issue is.

TABLE B

Sample Issues not of Interest

Type	Title	Body	Filename	Comment
Exclude	Disabled if read*	The option is disabled when*	Explorer.exe	This is not a warning.

Expanding on the issue table, these will appear in the Dialog Manager screen. The issues table is created from two lists—the FaultWire provided list, and a user list. The FaultWire list may be updated from time to time, without affecting the user list. When read in, the FaultWire list is read first, and the user list read second. If changes are made to these lists (via the Dialog Manager) or an update to the FaultWire list, it is desirable to have them take effect immediately, but it is

acceptable to require an unload/reload or reboot before it's accepted if too complex or other issues arise.

As an option, it is likely the invention should include a special case that does not attach the solution icon to any FaultWire dialog except for the test dialog. The concern is the possibility of some endless loop or hang should FaultWire issue a message and then FaultWire attempts to handle it.

When a Message appears, a user may wish to communicate the issue to another person. Without this invention, it is cumbersome to have to type in the message text and gather additional information about the issue and details about the computer where the Message occurred. FIG. **6** shows a Message **600** where the invention provides a means to send the Message and additional information to another person, typically via Email by selecting the button **604**. This button could be within the Message box, outside the box, as a drop-down from the Solutions button **602**, or other placement or hot-key. Other alternative communication types include sending a text message to a cell phone; converting text to voice for an audio link or phone call; or sending the text through an instant messaging system, or creation of a video to a remote user.

When the communication function is selected via **602**, the information collected is communicated to another party. The invention creates the message similar to FIG. **7-700**. The created message includes a default to address **702**. The invention can remember a default email address, such as a company's technical support email address or a technical friend that assists the user. The created message also includes a subject field **704** about the issue; summary information about the issue **706**, a link where to get additional information **708**; and details about the user's system **710**. The user can add further details if necessary before the message is sent.

Alternative Embodiments

An alternative method places the server components such as the issues database **114** and web pages **116** within the user's computer **100** so no outside communication is necessary. This has the advantage of not requiring a server or active communications link. A second alternative method uses both a local and remote server databases, where the local database is used when no outside communication is available, and once such outside communication is available the two databases are synchronized.

The invention is contemplated in various implementations and does not have to have a server-back end. The system could be built as a totally local application, along with a table of solutions and other content that would be provided to the user. This might have to be updated periodically, whereas the server solution has any updated solutions and content immediately available. The server design embodiment helps collect the content for problem evaluation and trend analysis, and makes it easier to create solutions to common problems.

Other Operations

The FaultWire client also retains a set of default list of exclusions and inclusions that function as if they are part of the Dialog manager (included in table below), but they do not normally appear in the dialog manager screen. Pressing an activation combination (Alt+F9 in this instance) acts as an "undocumented" toggle to switch the view to the default list. When switched to the default list, the text string appears just below the list box "Defaults shown—use Alt-F9 to revert to user list". When the default list is shown, you can add, remove and edit just like the user list.

The format of the internal data structure is not critical, but examples are discussed below, and with a strong preference to the use two XML files—One XML file contains the user's entries and resides in the user's directory. A second file has the FaultWire's defaults and resides where FaultWire was installed. This allows us to update the defaults without affecting the user's overrides. The user's entries always override any FaultWire defaults. XML also makes it slightly easier to maintain our default file without having to create an additional data management program.

Other features in alternate embodiments include:

The invention can include an Auto Check for updates which checks daily for updates when started (at boot-time) or when application is started.

A feature that sends error information when error occurs—When any error occurs that we detect and that has not been excluded, we send all the error information to our server before any action has occurred. This way we get frequency of occurrence information and gather information even if the user doesn't go to the FaultWire site. With this option disabled, the error information is only sent when the user clicks on the FaultWire icon. Typically a Modem user might disable this feature due to possible affects to system performance.

Maximum space for history log—Sets the maximum size of the history log. The history log is handled as a FIFO such that the oldest entries are removed when space is needed for new entries. The minimum space is 1 MB. The history log is also used when the internet connection is down. Entries are flagged as not-sent. When the internet connection is re-established, all pending entries are sent to the FaultWire server and the sent flag in the log is cleared.

Browser to use for Microsoft and Windows issues—This has two drop-down choices, IE or Default. Since Microsoft issues may eventually direct into a Microsoft site, and Microsoft sites often fail to work properly in any browser other than IE, this overrides the default browser in this one instance. It has no effect if the default browser is IE.

Optional email contact in particular embodiments (subscription versions)—When an email entry is provided, the drop-down control will be enabled to send an email message with critical information to the recipient. It can be used by corporate help desks and users who support other family members. This entry supports multiple email addresses when separated by a semi-colon, which are all passed in the same email message. No validation is made this entry. The field will default to blank. If trivial, we should also support entry of a URL in this field. If the entry starts out as "http://" then a browser is opened at the specified address. The URL option is intended for corporate help desks that use an http address rather than email.

Error Identification and Weighting

One method to identify errors is to have a list of items the system in the invention looks at and assign "weights" to each one. For example, if the word "Error" or "Warning" appears in the title or body text it has a high weight. If a system warning icon or error icon is shown, it also has a high weight. Other factors include if only a single "Ok" button appears, it may have a medium weight. A Bayesian filter could be used to implement this technique, although we'd have to deliver a list of keywords and weights. Alpha 1 may start with a fixed set of simple items to compare as we refine the approach to use.

When a dialog is identified as a warning or error type, the FaultWire icon is added to the dialog. At the same time, key information is sent to the history log. If the internet is available we query if the error has been previously recorded for this OS. The server responds either that it has the information, and no further details are required, or that it needs a complete set of data. In the event all data is needed, the FaultWire client then sends the complete data set to the server where it is recorded. In either case, the server also counts the request so we collect frequency of occurrence information. If the Internet is not available, it is flagged as unsent in the history log, so

that at a later time when the internet is active, all flagged history log items are sent in a similar way.

If the client setting "Send anonymous error information when error occurs" is off, then the information is only sent when they click on the "FaultWire" icon. Previously logged data is not sent in this state.

When the FaultWire icon appears, the user can take several actions within the dialog. They can ignore it and select any options presented by the dialog. They can click on the FaultWire icon. This opens a "dummy" progress dialog that indicates "Processing error information and linking to the FaultWire server". This will have a 45 second graphic progress indicator (without showing the actual time). It will also open the browser to the FaultWire web page specific for the error. Once the browser opens, our progress indicator can be canceled. It's just a dialog to placate the user when the browser application access is slow.

There is usually, if not always, a target page, since we have sent the error information used to create the web page in advance of displaying the page or will have sent the data before making the browser request. Note that double-clicking does not create two instances of the browser. Also the information is never sent twice to our server during the on-screen life of the dialog.

When the user hovers over the solution icon the tooltip appears with the message "FaultWire helps you understand and solve issues with this message".

The last option is to right click on the FaultWire icon. A drop-down menu appears with a set of functions. This is shown in FIG. A**2** (with alternative version of the program).

When the user clicks on an active function, the follow actions occur:

>>Selection A**2**(1) is Help with this issue—This is the same as clicking on the FaultWire icon and will bring up the browser with the information about this error.

>>Selection A**2**(2) Email my contact—This sends an email along with information. See section 3.4.4 for details.

>>Selection A**2**(3) Information summary—displays a pop-up dialog with selected error information. It will be identical to the Information summary screen available from History in section 3.3.3.

>>Selection A**2**(4) View history—Open the history log viewer showing all errors and warnings recorded. The log shows the title, application name and the date/time the issue occurred. See section 3.3.3 for complete details.

>>Selection A**2**(5) Title to clipboard—Copies the dialog title to the clipboard.

>>Selection A**2**(6) Body to clipboard—Copies all the body text to the clipboard.

>>Selection A**2**(7) Exclude dialog—Brings up a second dialog to exclude the dialog or application, which is shown in FIG. A**3** below.

>>Selection A**2**(8) Settings—FaultWire Pro—Displays the FaultWire settings dialog. The name in the drop-down changes in the free version to just "Settings—FaultWire".

In general, the following information is saved into the log and transmitted to the data collection server (See FIG. **1**) when the server requests full information. When a field is not available it is set to null. While not all of the information will be displayed to a user, it is collected to make better choices of combining like data and issues with specific system variants.

TABLE 1.1

Information within error dialog
Title of dialog
Text of dialog (we may impose a limit of 1024 characters)
Absolute position of the start of body text **
Text on each button, and which button is the default (if any), and xy position
Button style (system default, etc.)
Title bar icon (extracted as a 16 × 16 gif/png/jpg)*
Main body icon/graphic (extracted as a gif/png/jpg) - Use format of original graphic item, or what is easy to extract, with PNG preferred.
Icon identification if using standard system icon (Warning, Forbidden, etc.); otherwise indicate "Unknown"
Absolute position of main icon/graphic - These items will vary on different systems and OSes, but is useful to construct a fake dialog on the web site. We don't need have a perfect representation.
Secondary icon/graphic (if present, extracted as a gif/png/jpg) - Use format of original graphic item, or what is easy to extract, with PNG preferred.
Absolute position of secondary icon/graphic - These items will vary on different systems and OSes, but is useful to construct a fake dialog on the web site. We don't need have a perfect representation.
Width and Height of error dialog - These items will vary on different systems and OSes, but is useful to construct a fake dialog on the web site. We don't need have a perfect representation.
List of standard title bar icons shown, if any (cancel, help, minimize, etc.)
Screen shot of dialog (jpg, medium quality)

TABLE 1.2

Back traced Information
The application filename
The path of the application
The application timestamp
The application's manufacturer's name
The application's text description
The application's version
The fault module name
The fault module path
The fault module timestamp
The fault module manufacturer's name
The fault module's text description
The fault module's version
Exception Code*
Exception Offset*
Hang Type*
Hang Signature*
Notes - captured Problem Signature details from Windows Crash event*
Locale ID

*Selective fields only occur with crashes and hang events.

TABLE 1.3

System Information (collected on startup, does not need to be dynamic)
Current Operating system (i.e. Windows XP SP2)
Operation System binary version string (includes build number)
Current Skin style (i.e. XP Silver, Olive or Default). Custom skins use "default".*
Amount of physical memory*
CPU id*
Desktop width and height in pixels*
System language*

TABLE 1.4

Version Information
Type - Free or Pro
Version number
User's serial number if paid version (for subscription validation)

When collecting information, the preferred embodiment is careful that their own operations do not issue additional errors and must be far more tolerant of problems such as low memory, disk problems and other items that most applications ignore. There may be cases where information is not collectible, save or transmit the information to the data collection server. In general, the invention needs to be tolerant of all these situations without creating new errors.

It is also likely that dialogs will be encountered that shouldn't be attempted to deal with. As these are discovered, they can be added them to the exclusion list. The exclusion list should also include a "log only" option that will not even attempt to send it to the internet (for example, problems related to the internet connection).

The invention also includes an email feature to alert other users to a specific problem or assist a corporate help desk. In settings, the "Optional email contact" is filled in with one or more target email addresses. When the user right-clicks on the solution icon in the dialog, and then clicks on the drop-down option "Email my contact", the user's email client is opened and the message is pre-loaded with the following dialog information and system summary details. If the "optional email contact" field is blank, we should still allow generation of the email with a blank "to" field (assuming this is technically allowed).

Email Sample:

```
To:      Email contact from internal settings entry
From:    This user (assumed filled in by the email client program)
Subject: Help - Error dialog title text goes here, up to 80 characters max
The following issue appeared. Can you explain what it means and what I
can do to fix it?
Information from dialog:
        Title    Title goes here
        Text     Body text goes here
More detailed FaultWire information at:
http://www.FaultWire.com/AB123456.com
My system summary:
        OS              Windows Vista Ultimate, 6.0, Build 6000
        User Name       Frank
        Machine Name            Office-Vista
        CPU             Intel Pentium Duo Core
        Physical RAM 3327 MB
        System type     32-bit
        Hard drives     380 GB, 128 GB
        C Drive                 120 GB, 70% used
        Auto Updates On
        Firewall                On (Windows)
This email was generated by FaultWire - the integrated problem solver!
Users closing as inserted by email client
```

It will be necessary to hook various error dialogs. This means most dialogs need to be monitored and they are multiple ways for Windows to display dialogs. These may include when an Application crashes, Windows system messages and general messages from an application. The software must support double-byte languages generally.

The Pro serial will have an encoded flag to enable "staff" features within the client. These are features that make it easier to collect accurate information from a group of experts. This area has yet to be defined, but might provide advanced include/exclude features directly from the FaultWire drop-down with the ability to send this data to our server to help make our default include/exclude lists. It may be a v2 feature.

Settings will be stored in XML format rather than the registry.

When loaded, FaultWire will appear in the SystemTray. If double-clicked, the application will start. If right clicked, three options appear—FaultWire Website, Application, and Exit. The FaultWire Website goes to http://www.faultwire.com. Application runs the FaultWire application. Exit will unload FaultWire.

SQL will generally serve as the back-end database. This may be MySQL or another compatible design. The database collects information from the users. It needs to identify if the information has already been saved, and if so, only update various counters indicating the number of occurrences of a specific issue. The database design must have the flexibility to support large growth, should the project expand as expected. Whenever possible, the client application will be responsible for calculations and analysis, reducing the server run-time load.

The data is sent in one and possibly a second phase. With the first phase (stage=1), the client sends the server a subset of data to check if we have previously recorded the issue or not. If we don't have the issue (i.e. it's never been set for this issue), we'll then ask that the entire set be sent as a stage 2 or 3. I expect to complete this first phase today (data lookup, setting occurrence counters, etc.).

The server will return status and a URL that you will use if the user clicks on the FaultWire button. This page is NOT displayed to the user. In all cases, including if we've never recorded the issue, I'll provide a good URL. It may be replaced in stage 2, as stage 1 may provide a more generic URL if the data doesn't yet exist in the database.

For example, a brand new error occurs. You send the subset data to issue_check.php as stage 1. The server will return a code that requires the full set of data and a temporary URL should the user attempt press it before we've completed all our stage 2/3 operations in the background.

With the return code of 2 or 3 (send more data) the client sends all the data it has with stage=2 (or 3) to issue_check.php. The server saves the data in the database and links a number of items up. It will also return a final URL that replaces the URL in the first phase. Stages 2 & 3 are not yet implemented. I'll try and wrap it up this week, but it shouldn't slow down implementation of stage 1 on your end if you're ready. An SSL connection (https:// . . .) may be used to encrypt the data.

The database used in embodiments of the invention will be mostly manually generated initially, but automatic generation is contemplated by various embodiments as well. When client information is passed to the server, if the company name is not in the database it will be added, but at that time, no other information will be available.

TABLE 2.1

sample data field for use

Field name	Field Type	Size	Description	Example
KeyID	Varchar	100	This is made up of the company name, set to lower case and removing all characters other than A-Z and 0-9. Suffixes such as "Corporation", "Inc", "Ltd", "LLC", "Corp", "SA", "NV", "Company", "Co", "GmbH", are removed.	vcommunications
Name	Varchar	100	Full name	V Communications, Inc.
AltName	Varchar	40	Alternative company name (in KeyID format)	vcom
Status	Varchar	12	Status of item	Hidden, deleted, changed, reviewed
LockedBy	Varchar	30	Specify who is currently editing the entry to prevent two users from editing same entry.	frank
Importance	Varchar	10	Value of company to software messages	0 = not important, 3 = very important (i.e. large software company)
LinkCompnay	Varchar	40	When companies change name, this field links to the current company for address and other details	avanquestpublishingusa
LinkReason	Varchar	255	Why linked	V Communications was purchased by Avanquest in 2005
PrivateNotes	Text	-	Non-published internal notes	
Address1	Varchar	60	First street address	7031 Koll Center Parkway, Suite 150
Address2	Varchar	60	Optional Second Line	
City	Varchar	40	City	Pleasanton
State	Varchar	20	State or Provence	CA
Zip	Varchar	12	Zip or Postal code	94566
Country	Varchar	30	Country	USA
MainPhone	Varchar	30	Main phone number	1-925-425-1700
MainTollFree	Varchar	30	Main toll free number	1-800-325-0834
MainTollNote	Varchar	50	Special notes about number	Sales, Enter 1 at the voice prompt
MainFax	Varchar	30	Fax	1-925-425-1800
SupportPhone1	Varchar	30	Support	1-925-474-1701
SupportNote1	Varchar	50	Special notes about number	Enter 3 at the voice prompt
SupportPhone2	Varchar	30	Support Alternate	
SupportNote2	Varchar	50	Special notes about number	
SupportFax	Varchar	30	Separate Support Fax	
SupportEmail	Varchar	100	Tech support email	support@avanquestusa.com
SupportHours	Varchar	60	Normal hours	M-F 8 am to 5 pm PST
SalesEmail	Varchar	140	Sales email	sales@avanquestusa.com
WebMain	Varchar	140	Main company web page	http://www.avanquest.com
WebUSA	Varchar	140	Main usa web page (if different from WebMain)	http://www.avanquestusa.com
WebSupport	Varchar	140	Support web page	http://support.avanquestusa.com
WebDownload	Varchar	140	Download web page	
WebForum	Varchar	140	Forum or community web page	
WebSales	Varchar	140	Link to sales	
WebNews	Varchar	140	Link to companies press/news	
WebContact	Varchar	140	Page where address and phone numbers reside (FW use only - not shown to users)	
StockLookup	Varchar	20	Symbol required by Yahoo to look up data	AVQ.PA
StockText	Varchar	30	Stock symbol that appears in output	AVQ (Euronext)
YearStarted	Varchar	4	Year since started	1984
AnnualRevenue	Int	11	Company's annual revenue in millions	74

TABLE 2.1-continued

sample data field for use

Field name	Field Type	Size	Description	Example
Employees	Int	11	Number of employees	400
Description	Text	-	Description of company	Avanquest Software specializes in the development and publishing of personal and professional communication, utilities, security and multimedia software.
LogoLarge	Varchar	50	Image of logo up to 150 × 150 (optimize for 150 wide if not square)	logo_avanquest_150.jpg
LogoSmall	Varchar	50	Small 16 × 16 logo (may not be used)	logo_avanquest_16.gif
ModifiedDate	Datetime		Date and time of last update (auto-filled in)	20-Oct-2007 11:32 am
ModifiedBy	Varchar	10	Login name of last person to update (auto-filled in)	Frank
CountAccess	Int	11	Number of times accessed	23
CountIssues	Int	11	Number of issues assigned to this company (in issues databases)	3
DriverVendor	Varchar	50	Links to related keys in driver_vendors	13,234,1922

The KeyID must be unique. If necessary add a digit to make the name unique.

This database will be mostly automatically generated. The client program sends data and if needed, it is recorded in the database. See below for details on the process and field names. There are different types of tables:

Windows XP OS issue
Windows Vista OS issues
Windows 7 OS issues (future)
Windows 8 OS issues (future)
Application issues (i.e. not part of OS)
Crash and Hang Exception issues

Ideally, applications that are included as part of the OS will remain in the related OS table, but this may prove difficult and is acceptable if some or all of these end up in the application table.

For each issue table, there is a corresponding "raw" table, used to store the incoming client data. The raw tables allow for saving multiple sets of data from a client on any issue. We may elect to stop collecting data once some threshold has been met, such as 20 occurrences of the specific issue. This data can be useful in finding a solution and/or seeing if there is some specific set of facts that the issue occurs. For example, an issue occurs only in Windows XP SP1.

TABLE 2.2

Issue Data Table (generic)

Field name	Field Type	Size	Description	Examples
IssueKey	Int	11	Unique sequencal key	1001
Issue Code	Varchar	40	A hopefully unique hash of the non-variable text from the title, body, application name and exception code (if present) for this specific OS. 32 hex characters	6C13709C0BA708BB7600 29B6E5FBCA40
Status	Enum		Hidden, deleted, auto, changed, reviewed	Auto
LockedBy	Varchar	30	Indicates staff person who is currently editing record	Frankvg
PrivateNotes	Text		Staff notes that are never displayed to user	Joe - could you review the solutions?
OSMash	Varchar	20	Version mash up to identify the OS type comprised of OS name and Variant shortcuts like XPH (XP home); Version, Build, Service pack and bits (6 = 64, 3 = 32) [OS MASH is not currently used]	VHP606000P26 (This means: Vista Home Premium, v6.0, build 6000, Service Pack 2, 64-bit
OSNamePrimary	Varchar	20	Typically XP or Vista	XP Vista
OSNameType	Varchar	20	OS variant name	Professional (as in XP) Business (as in Vista)

TABLE 2.2-continued

Issue Data Table (generic)

Field name	Field Type	Size	Description	Examples
OSVersion	Varchar	10	Version followed by the 4 digit build number	5.1.2600 (XP) 6.0.6000 (Vista)
OSServicePack	Int	11	Service pack number	2
OSBits	Int	11	32 or 64 bit OS variant	32
CountOccursTotal	Int	11	Count of occurrences of dialog (user may not have viewed html)	163
CountMonth1	Int	11	Occurrences this month	121
CountMonth2	Int	11	Occurrences in month-1	36
CountMonth3	Int	11	Occurrences in month-2	6
CountMonth4	Int	11	Occurrences in month-3	0
CountMonth5	Int	11	Occurrences in month-4	0
CountMonth6	Int	11	Occurrences in month-5	0
CountMonth7	Int	11	Occurrences in month-6	0
CountMonth8	Int	11	Occurrences in month-7	0
CountMonth9	Int	11	Occurrences in month-8	0
CountMonth10	Int	11	Occurrences in month-9	0
CountMonth11	Int	11	Occurrences in month-10	0
CountMonth12	Int	11	Occurrences in month-11	0
CurrentMonth	Date		Holds the current date for occurrences counters. When actual month changes, counts for months over 1 year are discarded	2007-12-31
CountClientHits	Int	11	Count of html page views from FaultWire client (does not include manual and robot views)	96
CountAllPageHits	Int	11	Count of all html page views (Handled by server)	124
RatingSolved	Int	11	Number of users who rated it solved	28
RatingFailed	Int	11	Number of users who rated it as not working	1
CompanyLink	Varchar	100	Link to company database key	microsoft
CompanyRough	Varchar	100	Name extracted - only used if CompanyLink not built	Microsoft Corporation
DialogTitle	Varchar	255	Text within Titlebar	Destination Folder Access Denied
DialogBody	Text		Body text (supports line breaks and variables are removed - see notes after table).	You need permission to perform this action . . .
DialogWidth	Int	11	Width in Pixels of dialog	450
DialogHeight	Int	11	Height in Pixels of dialog	224
DialogTextHpos	Int	11	Horiz Pixel position of start of text	40
DialogTextVpos	Int	11	Vertical Pixel position of start of text.	24
DialogIcon1	Varchar	100	Titlebar icon 16 × 16	destination_folder3_title.png
DialogIcon2	Varchar	100	Main graphic	Warning4.png
DialogIcon2Hpos	Int	11	Horiz position of graphic 2	10
DialogIcon2Vpos	Int	11	Vert position of graphic 2	10
DialogIcon3	Varchar	80	Secondary graphic	destination_folder3_alt.png
DialogIcon3Hpos	Int	11	Horiz position of graphic 3	40
DialogIcon3Vpos	Int	11	Vert position of graphic 3	35
DialogScreenShot5	Varchar	80	Screen shot (XP or 1 of 4)	destination_folder3_screen.jpg
DialogScreenShot6	Varchar	80	Screen shot (Vista or 2 of 4)	destination_folder22_screen.jpg
DialogScreenShot7	Varchar	80	Screen shot (Win7 or 3 of 4)	destination_folder61_screen.jpg
DialogScreenShot8	Varchar	80	Screen shot (Win8 or 4 of 4)	destination_folder97_screen.jpg
DialogType	Varchar	20	Type of issue in text - Minor, Warning,, Fatal, Crtical, etc.	Warning
DialogButton1	Text		Text on first button	Try Again
DialogButton1Explain	Text		Description by FaultWire staff	This only works if you've fixed the issue while the dialog was left on-screen.
DialogButton1Style	Int	11	0 = xp, 1 = Vista, 2 = Vista wide mulit-line	0
DialogButton1Hpos	Int	11	Horiz position	322
DialogButton1Vpos	Int	11	Vert position	524
DialogButton2	Text		Text on button 2	Cancel
DialogButton2Explain	Text		Description by FaultWire staff	Close the dialog - no actions taken.
DialogButton2Style	Int	11	0 = default, 1 = Vista wide	0
DialogButton2Hpos	Int	11	Horiz position	389
DialogButton2Vpos	Int	11	Vert position	524

TABLE 2.2-continued

Issue Data Table (generic)

Field name	Field Type	Size	Description	Examples
DialogButton3	Text		Text on button 3	
DialogButton3Explain	Text		Description by FaultWire staff	
DialogButton3Style	Int	11	0 = default, 1 = Vista wide	
DialogButton3Hpos	Int	11	Horiz position	
DialogButton3Vpos	Int	11	Vert position	
DialogButton4	Text		Text on button 4	
DialogButton4Explain	Text		Description by FaultWire staff	
DialogButton4Style	Int	11	0 = default, 1 = Vista wide	
DialogButton4Hpos	Int	11	Horiz position	
DialogButton4Vpos	Int	11	Vert position	
DialogButton5	Text		Text on button 5	
DialogButton5Explain	Text		Description by FaultWire staff	
DialogButton5Style	Int	11	0 = default, 1 = Vista wide	
DialogButton5Hpos	Int	11	Horiz position	
DialogButton5Vpos	Int	11	Vert position	
DialogButtonDefault	Num	Byte	Which button is default (zero if no default)	1
DialogButtonClose	enum	True-False	Close button in title bar?	True
DialogButtonMax	enum	True-False	Maximize button in title bar?	False
DialogButtonMin	enum	True-False	Minimize button in title bar?	False
DialogButtonHelp	enum	True-False	Help button in title bar?	False
ProblemEventName	Text	30	Problem Event Name	APPCRASH
Application	Varchar	255	Name of the application	Explorer
AppFilename	Varchar	100	Filename of the application	Explorer.exe
AppPath	Varchar	255	Path of the application	C:\Windows
AppLink	Enum	True-False	True if link to filenames database is available	True
AppTime	Time		File time of application (modified)	15:23:00
AppDate	Date		File date of application (modified)	2007-12-31
AppDescription	Varchar	255	Description of application	File manager
AppVersion	Varchar	20	Version string	6.0.0
ModuleName	Varchar	100	Name of the fault module (if present)	Foobar2.dll
ModulePath	Varchar	255	Path of the fault module	C:\Windows
ModuleTime	Time		File time of fault module (modified)	14:19
ModuleDate	Date		File date of fault module (modified)	2007-12-31
ModuleLink	Enum	True-False	True if link to filenames database is available	True
ModuleDescription	Varchar	255	Description of fault module	Validity check
ModuleVersion	Varchar	20	Version string	6.0.0.123
ExceptionCode	Int	11	Exception code	0x12000CEF
ExceptionOffset	Int	11	Where Exception occurs	0xE2190238
HangType	Varchar	10	A digit from error message	0
HangSignature	Varchar	10	Hex value	a24b
CrashOS	Varchar	30	Currently unused	
LocaleID	Int	11	Language type	1033
English	Enum	True-False	If LocaleID is an English one	True
Description	Text		Description written in html by FaultWire team - can include html and images, no scripts	
Solutions	Text		Text for solution written in html by FaultWire team - can include html and image refrences, no scripts	
ForumLink	Varchar	100	Html link for accessing the forum on this topic	. . . /forums/showthread.php? t = 215
SearchAlt	Varchar	60	Alternative Search string for Google serarch. If blank, uses dialog title as string.	
Copyright	Text		Any copyright string, which can be helpful to identify some companies	Copyright 2008 © XYZ Inc., All rights reserved.
WinStyle	Varchar	10	Visual style - "xp", "basic", "framed" or "unframed"	basic
UserModifiedDate	DateTime		Date of last update automatically from user	2007-12-11 09:55:25

TABLE 2.2-continued

Issue Data Table (generic)

Field name	Field Type	Size	Description	Examples
UserModifiedBy	Varchar	40	Install GUID of user who's data was used	AB97AEE85E89C4CC093 AB8362D38C
FWModifiedDate	DateTime		Date of last update by FaultWire staff	2008-04-26 16:17:04
FWModifiedBy	Varchar	30	Who at FW did the last update	Frank

Other than counts and forced manual fields, other fields are set with the first occurrence and not changed afterwards, except by our manual intervention. The web page construction will use the user's actual values as overrides in some cases, such as the DAppPath, DAppTime, etc. See section 5.3 for more about overrides and how the data is used to construct the web page.

The invention may require manually add additional information to the issues tables, such as a description, solution, button explanations and/or an improved screen shot image. Once a field is filled in, it will not be overwritten. This allows modifications without future client errors changing this data. The frequency of occurrence data will also be used to focus efficiency on the most frequently occurring items.

The process for tracking and packaging the data for display is automatic. Only one class of solutions has an automatic solution—exceptions and BSoD (Blue Screen of Death) issues. Both of these errors include a specific code number in the error. When the this type of errors occur, we do a lookup to see if we already have this code along with solutions. If so, we can then include those solutions on the created web page. These solutions were created manually, and include most known Windows codes (about 1600 exceptions and maybe 300 fatal stop codes). The exception codes allow for a third-party vendor to create their own codes (which never overlap Microsoft's codes), in which case it would be unlikely we would have a solution, although it could be added. Third party codes are quite rare. For other errors and issues the solution has to be manually generated. Once a solution is created, then future users who encounter the problem will get the benefit of this solution automatically.

Items shaded in light green in table 2.2 are typically automatically created, or manually created after the issue data was saved. Depending on the event, it is unlikely that every item (in white) will be available. This is expected. Items in bold are the most critical items and should (hopefully) be available on every issue. Other items are also important, but might depend on a number of factors if the items are even available.

File names for graphics will be created by the server to ensure no overlaps with other messages.

The Web server portion of the invention will initially reside on the same computer as the database server, but may be located in different places for various embodiments of the invention. The design is flexible to support splitting the web server from the database server as the site portion of the invention expands. The Web server has the responsibility for accessing the database to build each issue page on-the-fly. A template design will complete the generic navigation, ads may be displayed and other visual elements. The main embodiment of the server is designed using PHP, JavaScript and MySQL to be very portable. Testing and proper operation is verified on web servers hosted by Windows Server 2008 and Linux.

The client program communicates with the FaultWire Web server through PHP server code using standard HTML POST protocols. A quick summary of actions includes checking if an issue has already been saved or not, transferring data if not saved, and getting a URL to be used that links the desired page.

For all data sent to the server, if a value is unknown, the client has the option of either not sending the item so that the server will assign a default value, or you can assign a default value of NULL (" ") for strings, and zero for values. The server code fully validates all data sent to it and will not generate an error if any optional field is missing.

In the stage 1 step, the client has detected an issue (warning, error or informational) and needs to find out if the server needs a full drop of data and to get what URL to call when a user elects to press the purple FaultWire button on the issue dialog.

The following set of data is sent to the server using the Post variables indicated to the URL.

TABLE 3.1

Data sent to server

Name	Examples	Stages Required	Notes
Stage	1	All	Stage 1 has limited info as shown below. Stage 2 or 3 used to send additional information
LicenseKey	ABCDE-12345-ABCDE-12345-ABCDE	All	will be blank for trial version
FWversion	1.01	All	Version of FaultWire
Debug	0, 42, 43	optional	See section 5.3.3
iFlag	4C2504E02F89D1D33A0C1305E823322	All	GUID created when FW installed (strip any dashes) - 16 bytes (32 hex characters)
Reg1	59812	1	(Random Value 0-65534) + 28237
Category	Vista, XP, App	All	If not from OS, category is App (Application)

TABLE 3.1-continued

Data sent to server

Name	Examples	Stages Required	Notes
OS	Vista, XP	All	
VendorRaw	Microsoft, Avanquest Publishing, Symantec Corp, Adobe	All	Category Vista/XP always uses "Microsoft"
Application	Explorer, Notepad, Firefox, Fix-It Utilities	All	Can be the filename without extension if there is no application name
Exception	301999192	All	Exception code comes from Application crashes (decimal). Ignore or set to zero if no exception
Title	Destination Folder Access Denied	All	Full title
Body	You need permission to perform this action keylooger.exe Date created: 2/12/2008 4:51 PM Size: 16.0 KB	All	Full body, include line breaks (C style \n)
TestData	Company Name: Foo Corporation www.mysite.com/index.html	None	Used for testing of filtering function only in debug mode. It is never sent from client nor saved.

The server checks if the issue has been saved (or required additional raw entries) or not, and returns the 3 items immediately following the keyword "FaultWire:" comma separated. For example: SITENAME: 1, http://www.faultwire-.com/solutions/Windows_Vista_solution.php?keyid=1001, (Ok)

TABLE 3.2

three results are explained

Name	Examples	Notes
Upload Value	1, 3	Indicates if more data needs to be sent: 0 = Error (database, server, etc.) 1 = Do not send more data - done! 2 = Send full data set, but no images 3 = Send full data set with images
Reg2	38293	Validation value to send in Stage 2 or 3
Solution URL	http://www.faultwire.com/solutions/Windows_Vista_solution.php?keyid=1001	Where to go if button clicked (it will be set to generic URL if the item has not been created yet and more data is needed).
Message	(Ok), (Unable to connect to database.), (Query problem.)	Usually "(Ok)", this is the text status with a short message if there is some problem. For now, this is internal use only (not displayed to the user).

In all cases a Solution URL will be provided. The Solution URL may change during later stages. For example, if the issue has never seen before, the Upload value of "3", will be returned, indicating a need for a full set of data. The Server will provide a temporary URL that if used, will go into a more generic part of the site rather than a specific issue. The duration between stage 1 and the end of later stage will be designed to be minimal.

These later stages, stages 2 and 3, are used to send data from the client to the server for saving. The data will be used in the results page or collected to assist in creating solutions. Functionally, these stages are similar to stage 1, but additional data is sent. All data goes to the same url as described above Many of these fields are optional and/or may not be relevant for a specific error or issue, but to the extent possible, the data should be collected and sent.

Stage 1 returns the upload value. If it returns a 2 or 3, it indicates we want more data as follows:

UploadValue=2 Send all the data as stage 2, but images are not necessary (screen shot, icons, etc.). This is typically used when we have at least 1 set of data, and we are only collecting additional data sets to assist the FaultWire staff with solutions. It is also used for crashes and hangs, since collecting a screen shot is problematic.

UploadValue=3 Send all the data as stage 3 and include all images that are available (screen shot, icons, etc.). In this case, we've detected this as a new issue we haven't seen before and we need to save all the data.

At the Web server, stages 2 and 3 are similar. Stage 3 will accept images, where in stage 2 they would be ignored. If images are present in Stage 3 AND we have not saved them before, we'll save them. If we have the images (and other fields) from a prior save and we are only collecting raw data, we'll ignore any images sent. The primary purpose of stage 2 is to reduce the communication data in some situations. It could be possible that we request a stage 3, and the client responds with stage 3 data, but may not have any images to send. No errors will be generated in this situation.

If a Stage 3 request is made, and image data is in the process of being uploaded, the user could close the error dialog before the data is completely sent. This causes a partial upload and the image is discarded.

The following chart helps explain the POST values we need. Note that the first items are the same as Stage 1. Stage 1 does not save any information other than to increment the occurrence counters for the issue (if it already exists). In the chart below, names in bold indicate Important fields (although some may remain undefined or blank if not relevant to the issue dialog).

TABLE 3.3

post values.

Name	Examples	Stages Required	Notes
Stage	2, 3	all	Stage 2 or 3 used to send additional information
LicenseKey	ABCDE-12345-ABCDE-12345-ABCDE	all	will be blank for trial version
FWversion	1.01	all	Version of FaultWire
Debug	0, 42, 43	optional	See section 5.3.3
iFlag	4C2504E02F89D1D33A0C1305E82C3322	all	GUID created when FW installed (strip any dashes) - 16 bytes (32 hex characters)
Reg1	59812	2, 3	Same value as sent in Stage 1 (not a new random number)
Reg2	38293	2, 3	Value returned from Stage 1
Category	Vista, XP, App	all	If not from OS, category is App (Application)
OS	Vista, XP	all	
VendorRaw	Microsoft, Avanquest Publishing, Symantec Corp, Adobe	all	Category Vista/XP always uses "Microsoft"
Application	Explorer, Notepad, Firefox, Fix-It Utilities	all	Can be the filename without extension if there is no application name
Exception	301999192	all	Exception code comes from Application crashes (decimal). Ignore or set to zero if no exception code
Title	Destination Folder Access Denied	all	Full title
Body	You need permission to perform this action keylooger.exe Date created: 2/12/2008 4:51 PM Size: 16.0 KB	all	Full body, include line breaks (C style \n)
OS_Name_Type	Business, Professional	2, 3	Windows Variant name
OS_Version	6.0.6000	2, 3	Full version
OS_Service_Pack	1	2, 3	Service pack number
OS_Bits	32	2, 3	32 or 64
Dialog_Text_Hpos	35	2, 3	First text horizontal starting position
Dialog_Text_Vpos	10	2, 3	First text vertical starting position
Dialog_Icon_2_Hpos		2, 3	Position of image2
Dialog_Icon_2_Vpos		2, 3	Position of image2
Dialog_Icon_3_Hpos		2, 3	Position of image3
Dialog_Icon_3_Vpos		2, 3	Position of image3
Dialog_Type	warning	2, 3	Type of issue in text - warning, fatal, forbidden, invalid, information, selection (based off of text in title or body, or type of icon)
Dialog_Button_1	Try again	2, 3	Text on button
Dialog_Button_1_Style	1	2, 3	0 = xp, 1 = vista, 2 = wide vista with multi-line text
Dialog_Button_1_Hpos	120	2, 3	Horizontal position
Dialog_Button_1_Vpos	220	2, 3	Vertical position
Dialog_Button_2	Cancel	2, 3	Text on button
Dialog_Button_2_Style	1	2, 3	0 = xp, 1 = vista, 2 = wide vista with multi-line text
Dialog_Button_2_Hpos	140	2, 3	Horizontal position
Dialog_Button_2_Vpos	220	2, 3	Vertical position
Dialog_Button_3		2, 3	Text on button
Dialog_Button_3_Style		2, 3	0 = xp, 1 = vista, 2 = wide vista with multi-line text
Dialog_Button_3_Hpos		2, 3	Horizontal position
Dialog_Button_3_Vpos		2, 3	Vertical position
Dialog_Button_4		2, 3	Text on button
Dialog_Button_4_Style		2, 3	0 = xp, 1 = vista, 2 = wide vista with multi-line text
Dialog_Button_4_Hpos		2, 3	Horizontal position
Dialog_Button_4_Vpos		2, 3	Vertical position
Dialog_Button_5		2, 3	Text on button
Dialog_Button_5_Style		2, 3	0 = xp, 1 = vista, 2 = wide vista with multi-line text
Dialog_Button_5_Hpos		2, 3	Horizontal position
Dialog_Button_5_Vpos		2, 3	Vertical position
Dialog_Button_Default	2	2, 3	Default button (1-5), 0 = no default
Dialog_Button_Close	true	2, 3	Title bar has a close button
Dialog_Button_Max	false	2, 3	Title bar has a Maximize button

TABLE 3.3-continued

post values.

Name	Examples	Stages Required	Notes
Dialog_Button_Min	false	2, 3	Title bar has a Minimize button
Dialog_Button_Help	false	2, 3	Title bar has a Help button
Problem_Event_Name	APP CRASH	2, 3	
App_Filename	Explorer.exe	2, 3	Application filename
App_Path	C:\windows\	2, 3	
App_Time	18:57:00	2, 3	Use 24-hour format
App_Date	2008-12-31	2, 3	Use YYYY-MM-DD format
App_Description	This is a description	2, 3	
App_Version	1.20.2345	2, 3	
Module_Name	Explorer.dll	2, 3	
Module_Path	c:\windows\	2, 3	
Module_Time	14:44:00	2, 3	Use 24-hour format
Module_Date	2008-12-31	2, 3	Use YYYY-MM-DD format
Module_Description	Handles network access for explorer	2, 3	
Module_Version	1.20.2345	2, 3	Text string - any format ok
Exception_Offset	3793289784	2, 3	Send as decimal
HangType	0	2, 3	Decimal?
HangSignature	A33f	2, 3	Hex
Locale_ID	1033	2, 3	Language code (1033 is English)
Copyright	2008 © XYZ, Inc.	2, 3	Text string - any format ok

Additional Images for Stage 3. No errors will occur if any or all of the images are missing. These images are passed along with the POST data above by using the name "upimages[ ]", as an array. The POST value holds the filename and must be exactly as shown in the table below—all lowercase. Use of any other filenames will be ignored and not saved. The server code will validate the file and save it under a new filename.

TABLE 3.4

Image values.

Name	Value	Stages Required	Notes
upimages[ ]	image1.jpg	3	This image is that appears in the title bar, typically 16 × 16. Many dialogs do not have this image.*
upimages[ ]	image2.jpg	3	This image is that appears within the body. Many dialogs do not have a body image.*
upimages[ ]	image3.jpg	3	This is a second image is that may appear within the body. Most dialogs do not have this image.*

TABLE 3.4-continued

Image values.

Name	Value	Stages Required	Notes
upimages[ ]	screen.jpg	3	The screen shot made by the client program. Size is not important, as the server will resize if necessary.

The following example shows of how a HTML file might send the image data for four images:

```
<form enctype="multipart/form-data" id="form1" name="form1"
method="post" action="..\_comm\issue_check.php">
<input name="Send" type="submit" id="Send" value="Send Data" />
  <input type="hidden" name="MAX_FILE_SIZE" value="500000" />
  // also limited at the server
<input name="upimages[ ]" type="file" size="80" maxlength="100" />
// one line for each image sent
<input name="upimages[ ]" type="file" size="80" maxlength="100" />
<input name="upimages[ ]" type="file" size="80" maxlength="100" />
<input name="upimages[ ]" type="file" size="80" maxlength="100" />
...
 </form>
```

TABLE 3.5

Image results are explained

Name	Examples	Notes
Upload Value	1	0 = Error (input, database, server, etc.) 1 = Done
Reg2	0	Not currently used, will be zero
Solution URL	http://www.faultwire.com/solutions/Windows_Vista_solution.php?keyid=1001	Where to go if FaultWire solutions button clicked
Message	(Ok), (Unable to connect to database.), (Query problem.)	Usually "(Ok)", this is the text status with a short message if there is some problem. For now, this is internal use only (not displayed to the user).

When stage 2 or 3 results are returned the database has been updated with the new data and a user should be able to click-through using the Solution URL to the specific page.

Server side actions with Stage 2 include:

Filter all input for length, html, bad characters, etc.

Filter the Title and Body text for variables, such as paths, filenames, URLs, dates, times, etc.

Build the IssueCode to uniquely identify the issue

Find the company/vendor and link it in if found

Save the data in the primary and raw tables as appropriate

Create and link the forum entry

Return the URL of the target page on the FaultWire site

Display debug information if so requested

Add faults and new vendors to the administration action list

The invention claimed is:

1. A method for assisting a computer user with problem-solving a software error on a computational device, comprising the steps of:

implementing and executing monitoring instructions on said computational device for detecting a software error in an user-launched executable program or operating system executed independently of said monitoring instructions, and determining a set of error parameters based on said software error;

displaying, on said computational device, an option to access and display a set of assistance instructions;

if said user chooses said option to access said set of assistance instructions, then accessing said set of assistance instructions based on set of error parameters; said set of assistance instructions stored on a networked server and accessed via network by said computational device;

weighting, on a second computational device connected to said network server, said set of said assistance instructions based on said set of error parameters;

displaying a set of assistance instructions on said computational device based on said weighting step;

adding to store of assistance instructions to said software error parameters on said networked server;

re-weighting said assistance instructions based on any user-implemented actions following said displaying step and said set of error parameters; wherein said displaying step includes determining the display characteristics of said executable program and mimicking said display characteristics in said executable program performing said displaying option step.

2. A method for assisting a computer user with problem-solving a software error on a computational device, comprising the steps of:

implementing and executing monitoring instructions on said computational device for detecting a software error in an user-launched executable program or operating system executed independently of said monitoring instructions, and determining a set of error parameters based on said software error;

displaying, on said computational device, an option to access and display a set of assistance instructions:

if user chooses said option to access said set of assistance instructions, then accessing said set of assistance instructions based on set of error parameters; said set of assistance instructions stored on a networked server and accessed via network by said computational device;

weighting, on a second computational device connected to said network server, sad of said assistance instructions based on said set of error parameters:

displaying a set of assistance instructions on said computational device based on said weighting step;

adding to store of assistance instructions to said software error parameters on said networked server;

re-weighting said assistance instructions based on any user-implemented actions following said displaying step and said set of error parameters, wherein said displaying a set of assistance instructions includes screen shots with blurred out areas that change for each user.

3. A method for displaying information related to a display message from a first user-launched executable software program or operating system on a computational device:

allowing a user to determine a set of variables to include or exclude from a set of display messages that may appear from said executable software program or operating system on said computational device;

monitoring said first user-launched executable program and/or operating system for one of said display messages from any of said first user-launched software program(s) and/or operating system;

determining if one of said display messages is included by using said set of user-determined variables;

extracting parametric information from a said included display message;

determining that said included display message is information, error or warning;

saving said included display message content and related information to data storage;

incrementing a frequency of occurrence counter;

displaying said message with an additional solution button on said computational device,

if said solution button is selected by a user, then:

displaying said saved information;

sending said parametric information to a database via a network;

checking said database for more information based on said parametric information, and if said more information is available then sending said more information via network to said computational device and displaying description solutions on said computational device.

4. The method for displaying information related to an display message as recited in claim **3**, further comprising the step of emailing alert other users to a specific problem or assist a corporate help desk.

* * * * *